HITACHI SERVICE MANUAL

TK **No. 1762 E**

VT-11A

Technical Data

VHS
THIS VIDEO DECK IS A VHS TYPE VIDEO RECORDER.
FOR PROPER OPERATION, ONLY THE VHS TYPE CASSETTE MUST BE USED.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

VIDEO CASSETTE RECORDER

June 1982 **TOKAI WORKS**

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LIST OF DIFFERENCES

Item		VT-9100A	VT-11A
Function		○ Stop ○ Record ○ Play ○ Pause ○ Fast forward/Rewind ○ Forward/reverse visual search	Same as VT-9100A
Remote control system		8 mode wired system	Same as VT-9100A
Recording speed		3 modes (SP/LP/EP)	Same as VT-9100A
Play speed		5 modes (SP, LP, EP, visual search)	Same as VT-9100A
Chassis		"S" type chassis	"U" type chassis
Tape counter		4 digit electronic counter (Also used for timer display)	Same as VT-9100A
Servo	Speed control	Analog system	Analog system (new IC employed)
	Phase control	Analog system	Digital system (new IC employed)
	Capstan motor	DD motor	DC motor (also used as reel motor) (Belt drive type)
	Cylinder motor	3-phase DD motor	Single phase DD motor
Timer		1 program/10 days	Same as VT-9100A (new IC employed)
Tuner	Channel select system	Electronic tuning	Same as VT-9100A (new shape)
	Channel selection	12-channel mechanical lock	Same as VT-9100A
Y · chroma		3-IC configuration (same as VT-6500A)	Same as VT-9100A (a part improved)
Audio		1-IC configuration	Same as VT-9100A

SPECIFICATIONS

Recording system:	Rotary two head Helical Scan Azimuth Recording
Video:	NTSC color EIA standard
Tape speed:	33.35 mm/sec (SP mode)
	16.67 mm/sec (LP mode)
	11.12 mm/sec (EP mode)
Tape width:	12.7 mm
Cassette:	VHS Type T-30, T-60, T-120, T-160
Channel reception:	VHF channels 2-13
	UHF channels 14-83
RF input:	VHF 75 Ω, UHF 300 Ω
RF output:	Channel 3 or 4
Video input:	0.5-2 Vp-p, 75 Ω unbalanced
Video output:	1.0 Vp-p, 75 Ω unbalanced
Video Recording S/N :	Better than 4.6 dB (SP)
	Better than 43 dB (LP)
	Better than 40 dB (EP)
Horizontal resolution:	240 lines or more (SP), 230 lines (LP), 230 lines (EP)
Audio input:	-20 dB/50 kΩ or more
Audio output:	-6 dB/300 Ω
Audio frequency response:	50 Hz – 10 kHz (SP)
	50 Hz – 7 kHz (LP)
	100 Hz – 6 kHz (EP)
Audio S/N:	Better than 43 dB (SP)
	Better than 40 dB (LP)
	Better than 40 dB (EP)
Power supply:	AC 120 V, 60 Hz
Power consumption:	39 W Nominal
Cabinet size:	43.5 (W) x 12.7 (H) x 33.9 (D) cm 17-1/8" (W) x 5" (H) x 13-3/8" (D)
Weight:	17.8 lbs (8.1 kg)
Accessories:	1 - Coaxial cable with E-type connectors
	1 - UHF twin lead
	1 - Matching transformer 300 - 75 ohm
	1 - Matching transformer 75 - 300 ohm
	1 - Remote pause switch
	1 - T-30 Cassette tape
	1 - Channel palte
	1 - Channel card holder

SAFETY PRECAUTION

The following precautions should be observed when servicing.

1. Since many parts in the unit have special safety-related characteristics, always use genuine Hitachi replacement parts. Especially critical parts in the power circuit block should not be replaced with other makes.
   Critical parts are marked with ⚠ in the schematic diagram and circuit board diagram.
2. Before returning a repaired unit to the customer, the service technician must thoroughly test the unit to a scertain that it is completely safe to operate without danger of electrical shock.

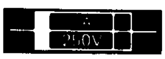
FOR CANADA

CAUTION AGAINST FUSE REPLACEMENT

FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH SAME TYPE AND SAME RATING FUSE IN ACCORDANCE WITH THE FUSE SYMBOL LABEL.

The following is the indication of the fuse symbol label which is affixed adjacent to the fuse in the equipment.

* Example



This symbol indicates Fast Operating Type 2A, 250V Fuse.

KEY TO ILLUSTRATIONS

RECORD BUTTON ●

Press RECORD button and while holding RECORD, press PLAY button to record.

PLAY BUTTON ▶

Press to start play.

CASSETTE HOLDER

TIMER SWITCH

Press after programming Digital Clock.

STOP BUTTON ■

Press to stop tape. The STOP button must be pressed between "RECORD" and any other operation. The STOP button must be pressed before "EJECT".

COUNTER RESET BUTTON

To reset counter to "0".

TIMER DISPLAY INDICATOR

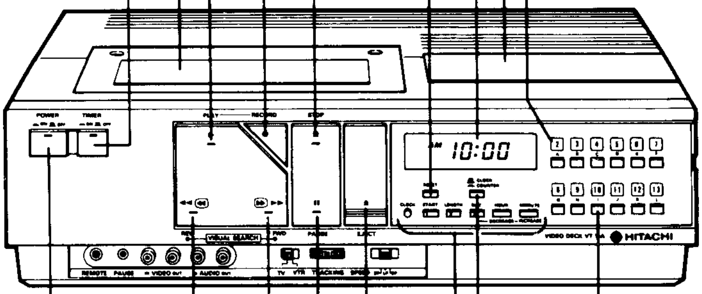
This shows the time with a 12-hours display and also shows tape position.

FINE-TUNING ACCESS DOOR

Open this door and set the channel.

CHANNEL INDICATOR

Will light when channel select button is pressed.



POWER SWITCH

Turn system power on and off.

REWIND/VISUAL SEARCH BUTTON ◀◀

Press to start rewind.
Press this button during playback of an EP or SP recorded tape. Reverse playback picture at high speed can be seen.

FAST FORWARD/VUSUAL SEARCH BUTTON ▶▶

Press to activate fast forward.
Press this button during playback of an EP or SP recorded tape. Forward playback picture at high speed can be seen.

PAUSE BUTTON II

Press to pause during recording or playback.

CHANNEL SELECT BUTTON

Select the channels you wish to view or record by pressing these buttons.

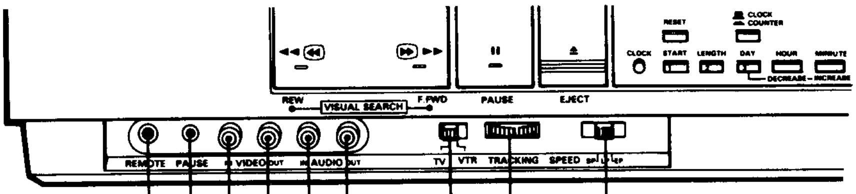
CLOCK/TAPE COUNTER SELECT BUTTON

Select the indication of timer display for either "CLOCK" or "TAPE COUNTER".

TIME SET BUTTONS

EJECT BUTTON ⏏

Press to insert or remove cassette. The STOP button must be pressed before "EJECT".


REW
VISUAL SEARCH
F.FWD
PAUSE
EJECT
RESET
CLOCK COUNTER
CLOCK
START
LENGTH
DAY
HOUR
MINUTE
DECREASE - INCREASE
REMOTE
PAUSE
IN VIDEO OUT
IN AUDIO OUT
TV
VTR
TRACKING
SPEED
SP LP EP

REMOTE CONTROL JACK

Connect Remote Control Unit (Optional Accessory).

CAMERA PAUSE JACK

Connect Camera Pause cable or Remote Pause Switch (provided).

VIDEO IN

Receives video signal from a video camera or another VTR.

VIDEO OUT

For connection to monitor TV.

AUDIO IN

Receives audio signals from a camera, external sound equipment, or from another VTR.

TAPE SPEED SELECTOR

EP: 6 Hours recording
LP: 4 Hours recording
SP: 2 Hours recording
Note: Playback speed automatically corresponds with recorded speed.

TRACKING CONTROL KNOB

To minimize noise in playback.

OUTPUT SELECTOR

Set to VTR position for video recording or playback. Set to TV position to watch TV.

AUDIO OUT

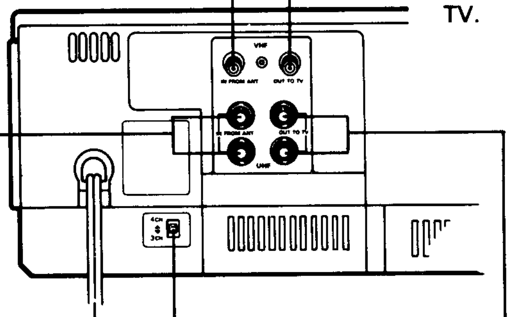
For a connection to stereo equipment, etc.

VHF ANTENNA INPUT

Connect the VHF antenna to this terminal.

VHF ANTENNA OUTPUT

Connect this terminal to the VHF antenna terminal on the back of the TV.


VHF
IN FROM ANT
OUT TO TV
UHF
4CH
3CH

UHF ANTENNA INPUT

Connect the UHF antenna to these terminals.

POWER CORD

Connect to a 120V AC outlet.

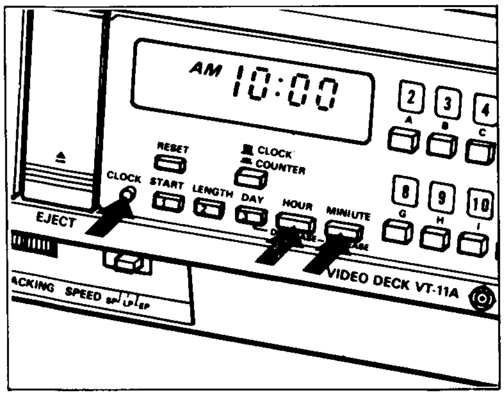
UHF ANTENNA OUTPUT

Connect these terminals to the UHF antenna terminals on the back of the TV.

RF CONVERTER SWITCH

Select this switch to CH3 or CH4 channel (unused channel) by using small screw driver.

SETTING CLOCK FOR CORRECT TIME


AM 10:00
RESET
CLOCK
COUNTER
CLOCK
START
LENGTH
DAY
HOUR
MINUTE
EJECT
VIDEO DECK VT-11A
SPEED

❶ Press the HOUR button while pressing the CLOCK SET button. "1' to "12" will appear in sequence: release the HOUR button when the present hour is displayed. (12 hour clock)

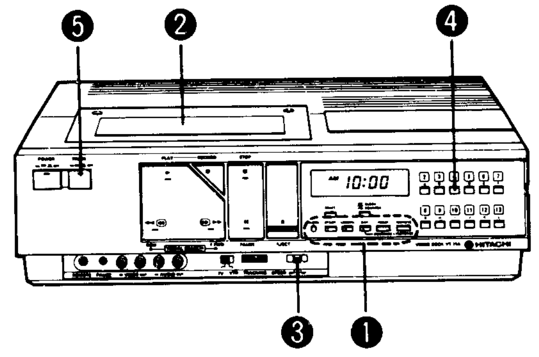
❷ Press the MINUTE button while pressing the CLOCK SET button. "0" to "59" will appear in sequence; release the MINUTE button when the present minute is displayed.

❸ The clock starts when the CLOCK SET button is released.

Note:
- When Video Deck is plugged into an AC outlet for the first time, the built-in timer is flashing at 12:00.
- When holding the CLOCK SET button and HOUR button or MINUTE button down, the numbers will change continuously after 2 seconds.
- If the Timer Display is flashing, your home has had a temporary loss of power and time should be reset.

TIMER RECORDING (UNATTENDED RECORDING)

Once you have set the Timer built-in Video Deck for unattended recording, you can forget about it. The Timer will turn your Video Deck on and off at the time you set. However, if the tape runs out, the unit will stop automatically.



❶ Set the 10 day timer.
"START TIME", "OPERATION LENGTH", "DAY" etc.
Refer to the "SETTING THE 10 DAY TIMER" on page 10.

❷ Insert the Cassette.
Be sure to check that the record safety tab is not missing. If the record safety tab is missing, recording will not begin.

❸ Set speed selector to "EP", "LP" or "SP".

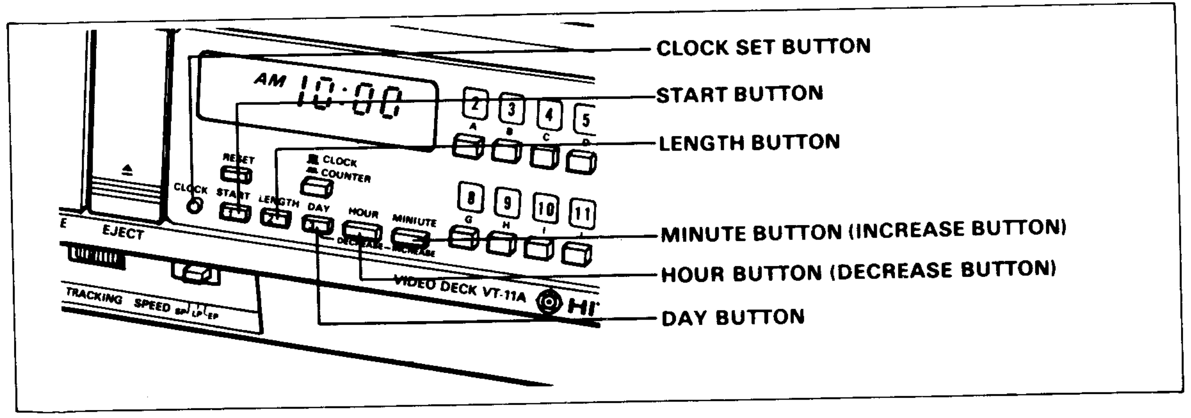
❹ Press channel select button to be recorded.

❺ Set Timer Switch of Video Deck to ON.
Now recording will begin at start time.

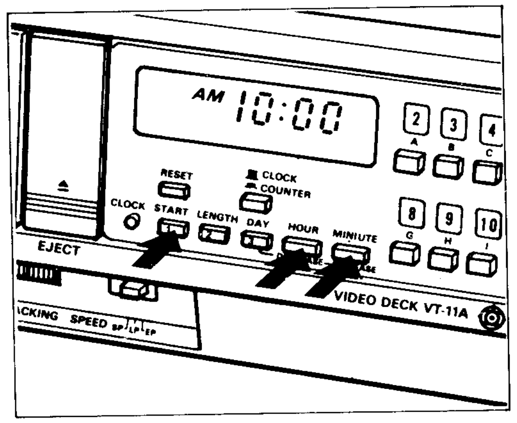
Note:
- It is not necessary to press PLAY and RECORD buttons.
- Recording begins automatically at starting time.
- TV does not have to be on for Timer Recording.
- When Timer Switch is on, your VTR cannot be operated manually.
- Do not press timer setting buttons during "TIMER RECORDING" mode.
- If the record safety tab is missing, the timer indicator will flash on and off to warn you.

To monitor program to be recorded.
1. Turn on TV and set the channel of your TV to CH3 or CH4 (for your video channel).
2. Turn off Timer Switch and Turn on Power Switch of the VTR.
3. Set the output selector to "VTR".
4. After checking the program, turn off TV and set the Timer Switch of the VTR to ON.

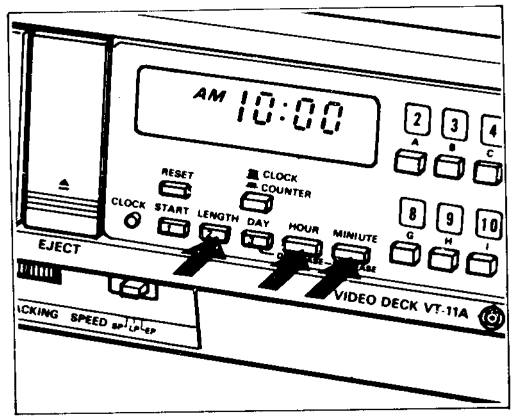
SETTING THE 10 DAY TIMER


AM 10:00
RESET
CLOCK
START
LENGTH
DAY
HOUR
MINUTE
COUNTER
EJECT
TRACKING
SPEED
VIDEO DECK VT-11A
CLOCK SET BUTTON
START BUTTON
LENGTH BUTTON
MINUTE BUTTON (INCREASE BUTTON)
HOUR BUTTON (DECREASE BUTTON)
DAY BUTTON

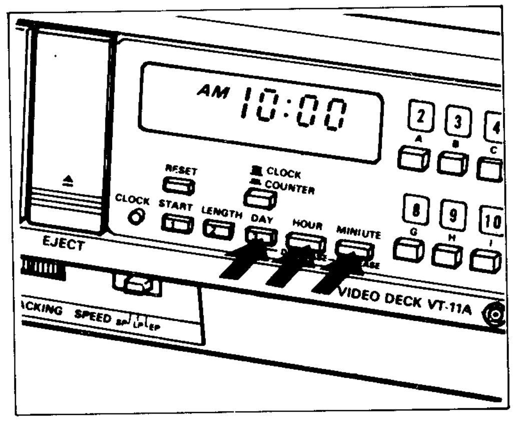
SETTING THE 10 DAY TIMER


AM 10:00
RESET
CLOCK
COUNTER
START
LENGTH
DAY
HOUR
MINUTE
EJECT
SPEED
VIDEO DECK VT-11A

❶ Setting the starting time.
Press the HOUR button while pressing the START button. Keep the button pressed until the starting time of the program to be stored in the timer is displayed, and then release it.
Press the MINUTE button with the START button pressed; continue pressing the button until the starting minute is displayed, and then release it.


AM 10:00
RESET
CLOCK
COUNTER
START
LENGTH
DAY
HOUR
MINUTE
EJECT
SPEED
VIDEO DECK VT-11A

❷ Setting the operation length.
Press the MINUTE button while pressing the LENGTH button. Release the button when the operation length time is displayed.
Press the HOUR button while pressing the LENGTH button. Release the button when the operation length is displayed.
Example: 1 hour and 15 minutes recording time is 1:15.


AM 10:00
RESET
CLOCK
COUNTER
START
LENGTH
DAY
HOUR
MINUTE
EJECT
SPEED
VIDEO DECK VT-11A

❸ Press the INCREASE or DECREASE button while pressing the DAY button.
(Press the DECREASE button to reduce the number, press the INCREASE button to increase the number.)
Numbers from "0" to "9" will appear in sequence.
"0" shows the today. "1" shows tomorrow.
(The letter "d" after "9" shows everyday.)
Release the buttons when the desired day is displayed.
Note: Numerals are not changed continuously when the DECREASE or INCREASE button is pressed.
You must press it repeatedly.

CAUTIONS:
1. To change the timer setting.
   - Set the OPERATION LENGTH and DAY again after changing the START time.
   - Change only the item needed to be changed; either the OPERATION LENGTH or DAY.
2. The reserved times can be checked by pressing the corresponding buttons.
   For example, the reserved START time is indicated on the display when the START button is pressed.
3. When the timer recording starts, the timer indicator, power indicator and channel indicator light.

DISASSEMBLY

1. Removing the case

1-1 Channel preset cover (Fig. 3)

① Open the channel preset cover and pull it in the direction of arrow ① to remove it.

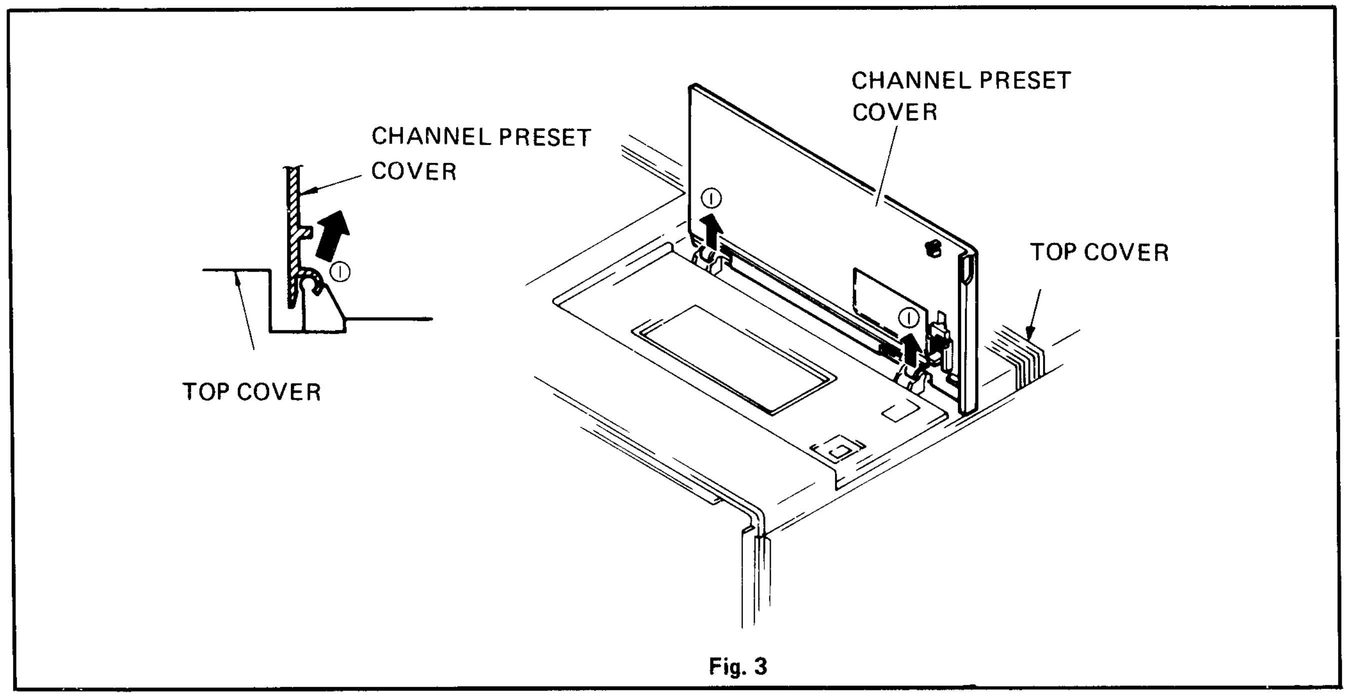

CHANNEL PRESET COVER
CHANNEL PRESET COVER
①
①
①
TOP COVER
TOP COVER

Fig. 3

1-2 Top cover (Fig. 4)

1 Remove the 3 screws (1).

2 Lift the rear of the top cover first, and then lift the whole top cover to remove it.

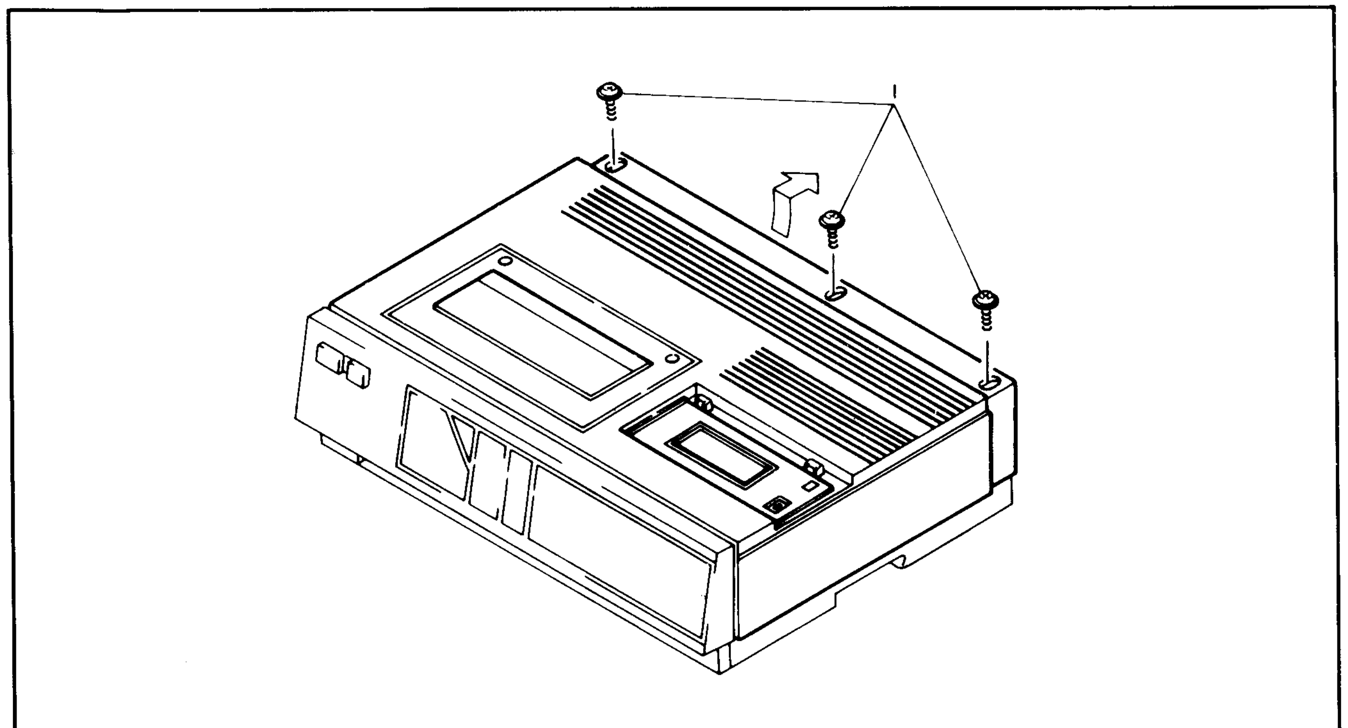


Fig. 4

1-3 Bottom cover (Fig. 5)

① Remove the 7 screws (2-1, 2-2)

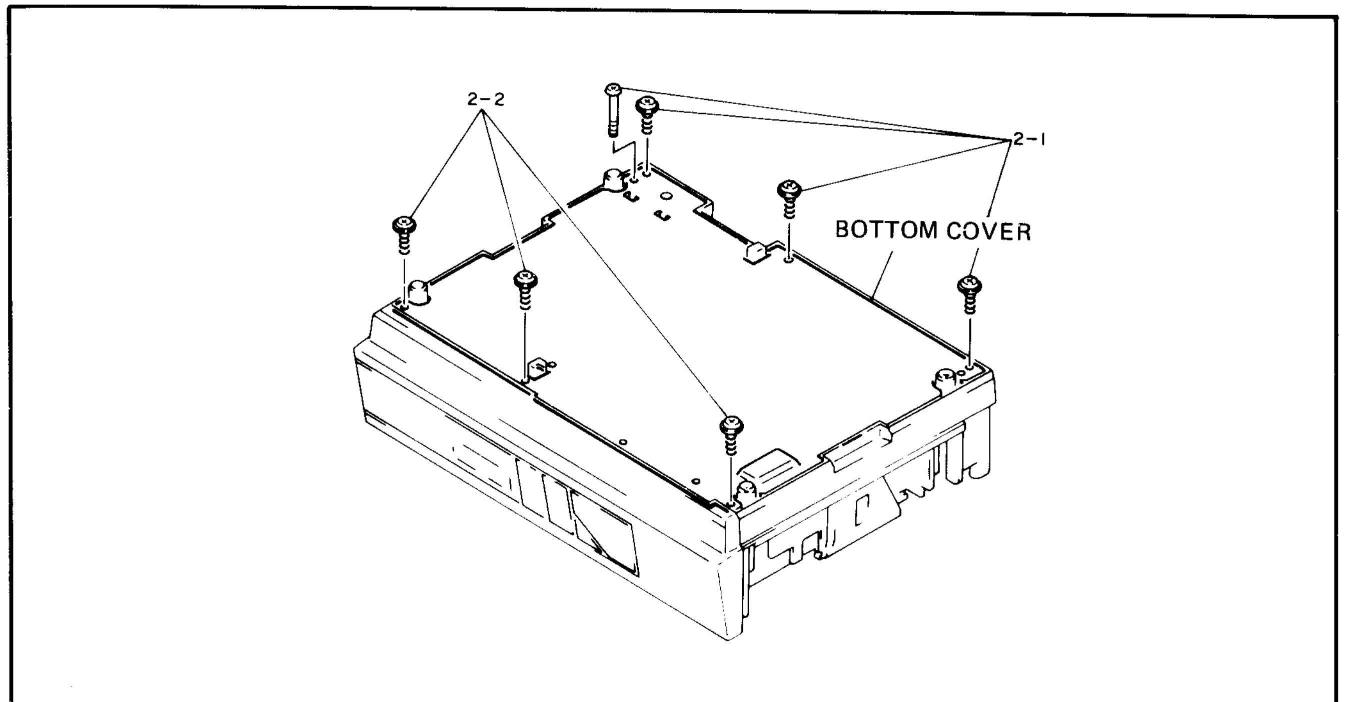

2-2
2-1
BOTTOM COVER

Fig. 5

1-4 Front panel (Fig. 6)

① Remove the top cover. (Refer to Item 1-2)

② Remove the 3 screws (2-2) shown in Fig. 5 and the 1 screw (3) shown in Fig. 6.

③ Remove the stoppers (4) at 3 positions from the deck frame.

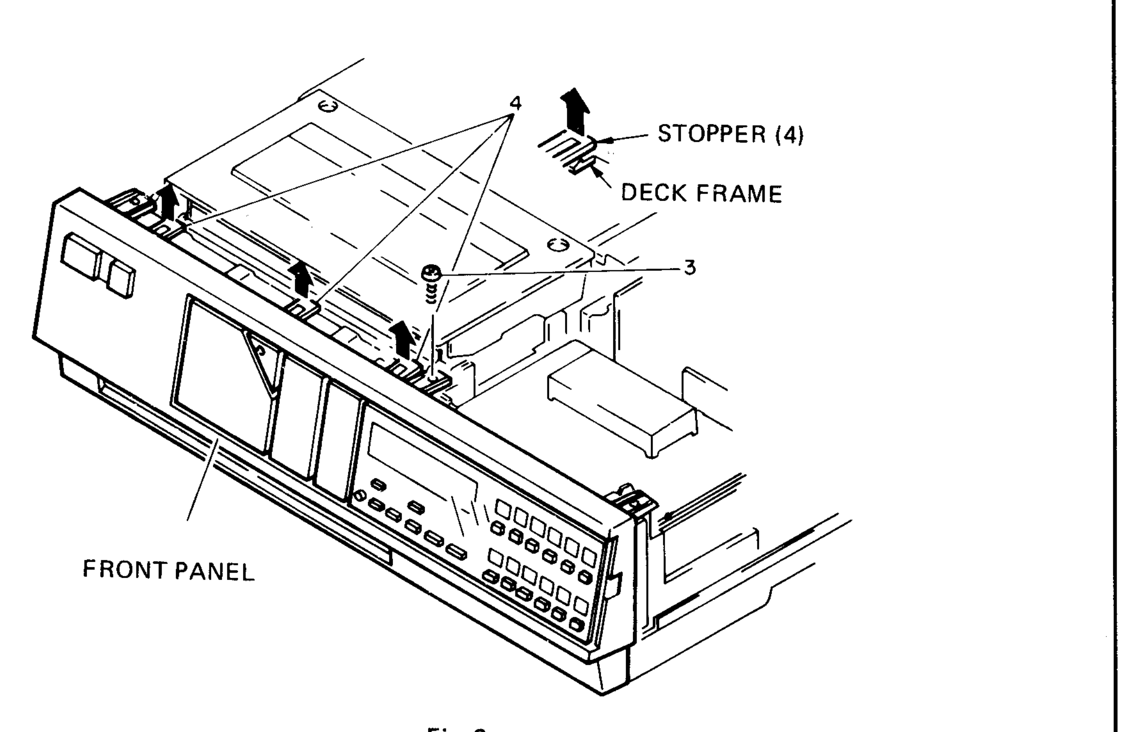

4
STOPPER (4)
DECK FRAME
3
FRONT PANEL

Fig. 6

1-5 Cassette lid (Fig. 7)

① Remove the 2 screws (5).

② Open the cassette holder, lift the rear of the cassette lid a little and pull it toward you.

* Assemble the cassette lid in the reverse procedure of the above.

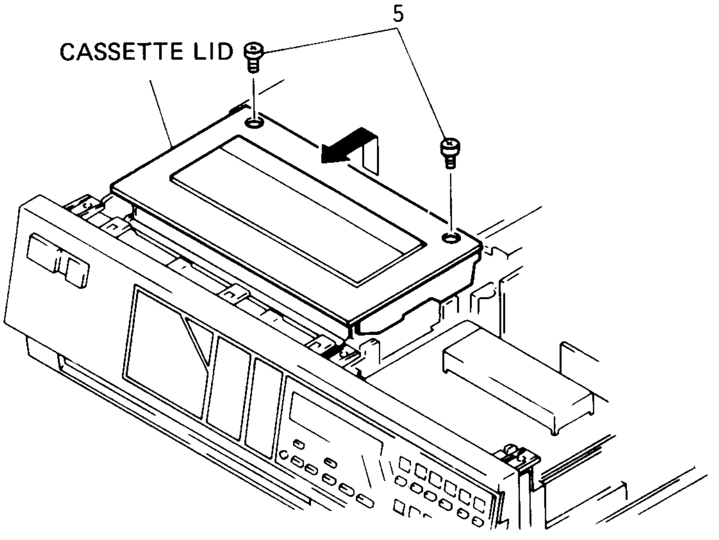

5
CASSETTE LID

Fig. 7

2. Removing the PC Boards

2-1 Names and locations of the PC Boards

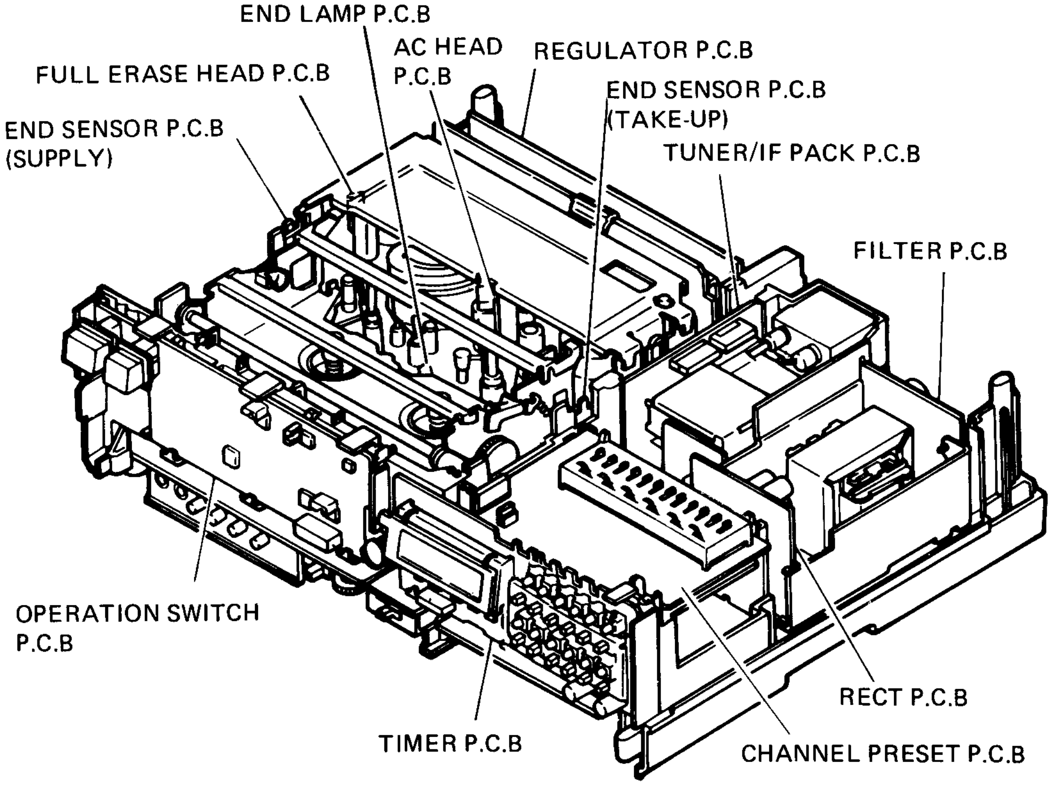

END LAMP P.C.B
AC HEAD P.C.B
REGULATOR P.C.B
FULL ERASE HEAD P.C.B
END SENSOR P.C.B (TAKE-UP)
END SENSOR P.C.B (SUPPLY)
TUNER/IF PACK P.C.B
FILTER P.C.B
OPERATION SWITCH P.C.B
RECT P.C.B
TIMER P.C.B
CHANNEL PRESET P.C.B

Fig. 8

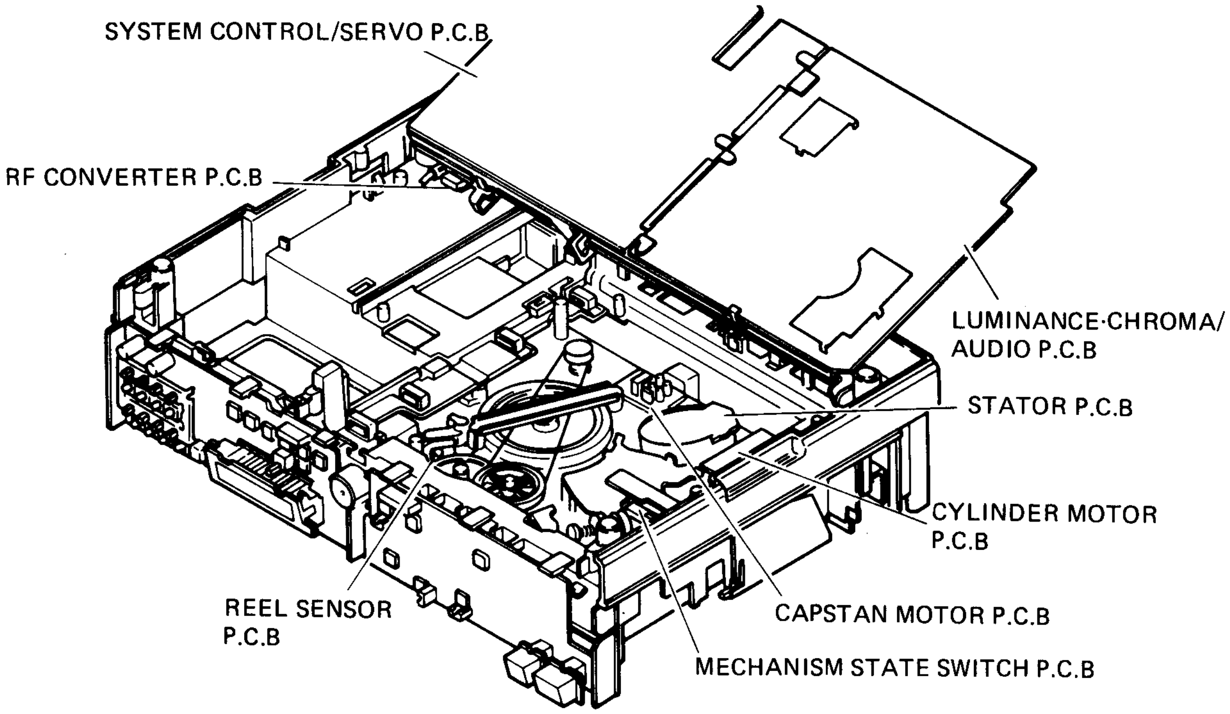

SYSTEM CONTROL/SERVO P.C.B
RF CONVERTER P.C.B
LUMINANCE·CHROMA/ AUDIO P.C.B
STATOR P.C.B
CYLINDER MOTOR P.C.B
REEL SENSOR P.C.B
CAPSTAN MOTOR P.C.B
MECHANISM STATE SWITCH P.C.B

Fig. 9

2-2 Operation switch PC Board (Fig. 10)

① Remove the top cover. (Item 1-2)
② Remove the front panel. (Item 1-4)
③ Remove the connector (6).
④ To remove the PC Board, push up the 3 stoppers (7-1), which attach the operation switch PC Board, in the direction of the arrow, to release enagagement between the PC Board and the stoppers (7-2).

* Assemble the operation switch PC Board in the reverse procedure of disassembly, and check that all operation switches work normally after assembly.

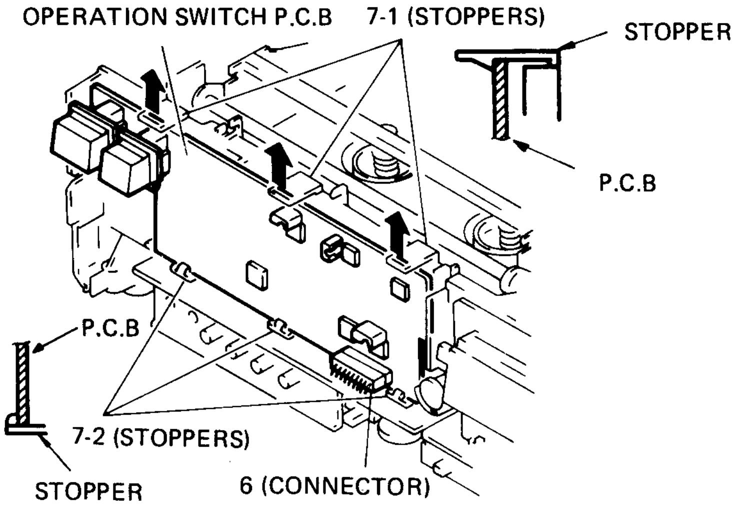

OPERATION SWITCH P.C.B
7-1 (STOPPERS)
STOPPER
P.C.B
P.C.B
7-2 (STOPPERS)
STOPPER
6 (CONNECTOR)

Fig. 10

2-3 Channel preset PC Board/Timer PC Board (Fig. 11, 12)

① Remove the top cover. (Item 1-2)

② Remove the front panel. (Item 1-4)

③ Remove the 2 connectors (8) of the channel preset PC Board.

④ Push the 4 stoppers (9), which attach the channel preset PC Board, in the direction of the arrow to release the engagement between the PC Board and stoppers, and then lift the rear of the board by approx. 90° as shown in Fig. 12.

⑤ Remove the 1 connector (6) of the timer PC Board.

⑥ Release engagement between the PC Board and 1 stopper (7) while pushing the stopper in the direction of the arrow, and then lift the PC Board in the direction of arrow (A) while releasing engagement between the lower 3 stoppers (8) and the PC Board.

* Assemble the channel preset PC Board in the reverse procedure of disassembly.

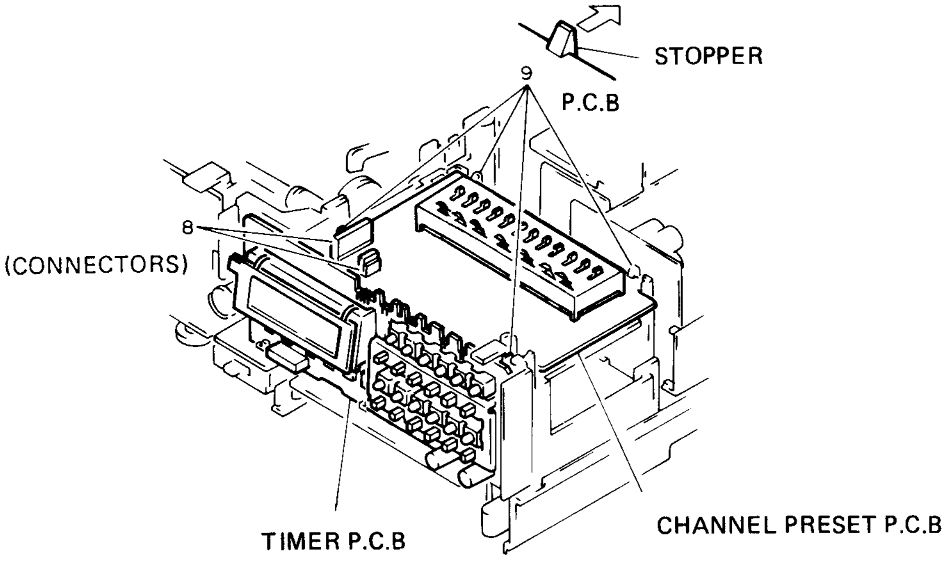

STOPPER
P.C.B
9
8
(CONNECTORS)
TIMER P.C.B
CHANNEL PRESET P.C.B

Fig. 11

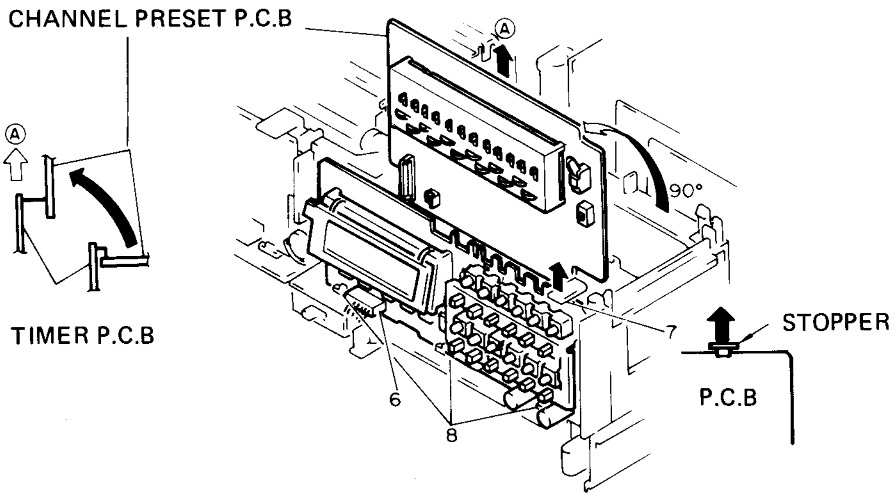

CHANNEL PRESET P.C.B
Ⓐ
Ⓐ
90°
TIMER P.C.B
7
STOPPER
P.C.B
6
8

Fig. 12

2-4 Filter PC Board (Fig. 13)

① Remove the top cover. (Item 1-2)

② Remove the 1 screw (9) and pull the PC Board in the direction of arrows (A) → (B) to remove it from the power section frame.

2-5 Rectifier PC Board (Fig. 13)

① Remove the top cover. (Item 1-2)

② Lift the PC Board in the direction of arrow (10) to remove it.

2-6 Tuner/IF pack (Fig. 13)

① Remove the top cover. (Item 1-2)

② Remove the 2 connectors (11).

③ Remove the 3 screws (12).

* Assemble the tuner/IF pack in the reverse procedure of disassembly.

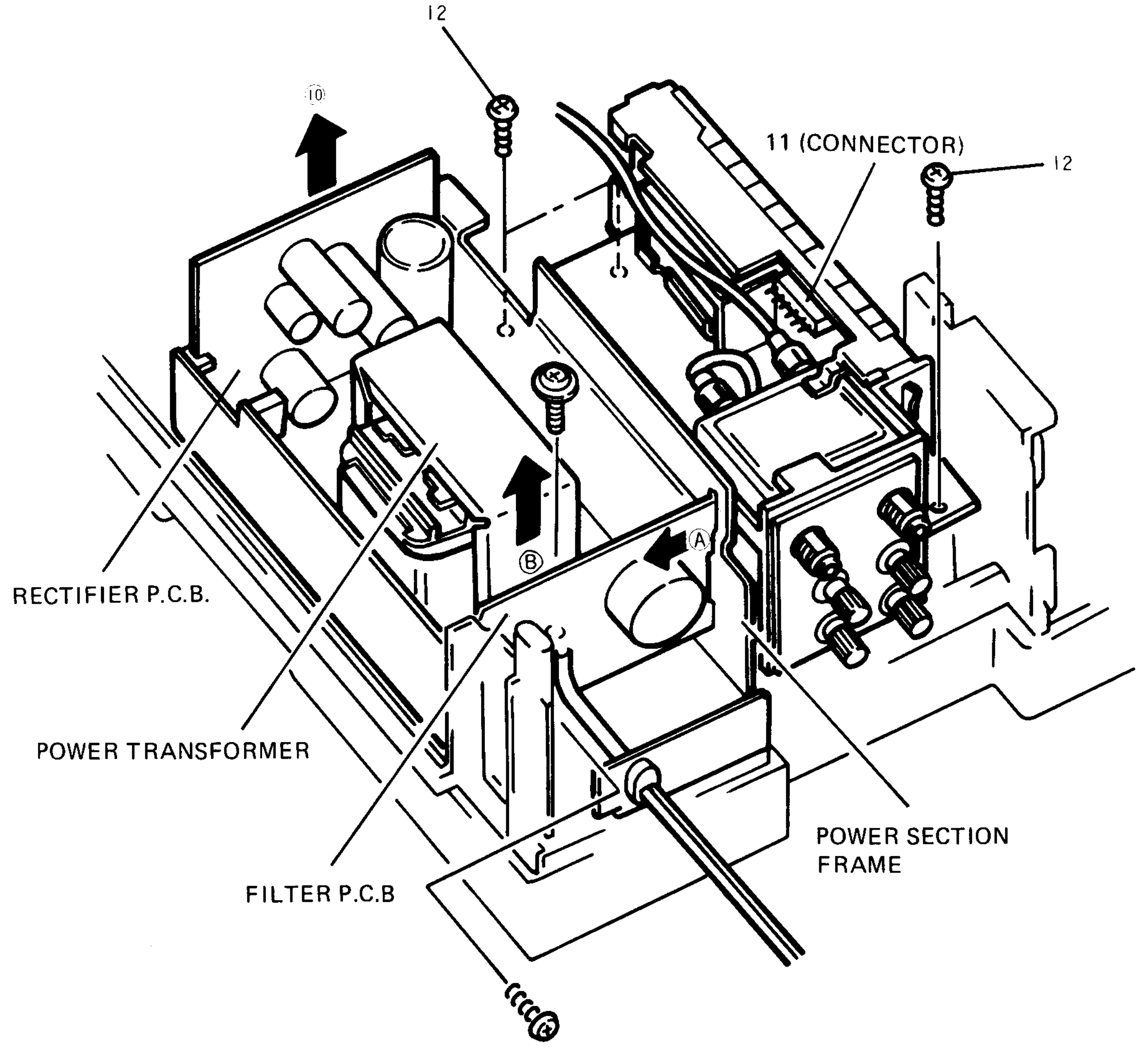

12
⑩
11 (CONNECTOR)
12
Ⓐ
Ⓑ
RECTIFIER P.C.B.
POWER TRANSFORMER
FILTER P.C.B
POWER SECTION FRAME

Fig. 13

2-7 Regulator PC Board (Fig. 14)

① Remove the top cover. (Item 1-2)

② Lift the PC Board holder (13) in the direction of the arrow to release engagement (14) between the PC Board and the stoppers, and then lift the PC Board in the direction of arrow (A) to remove it.

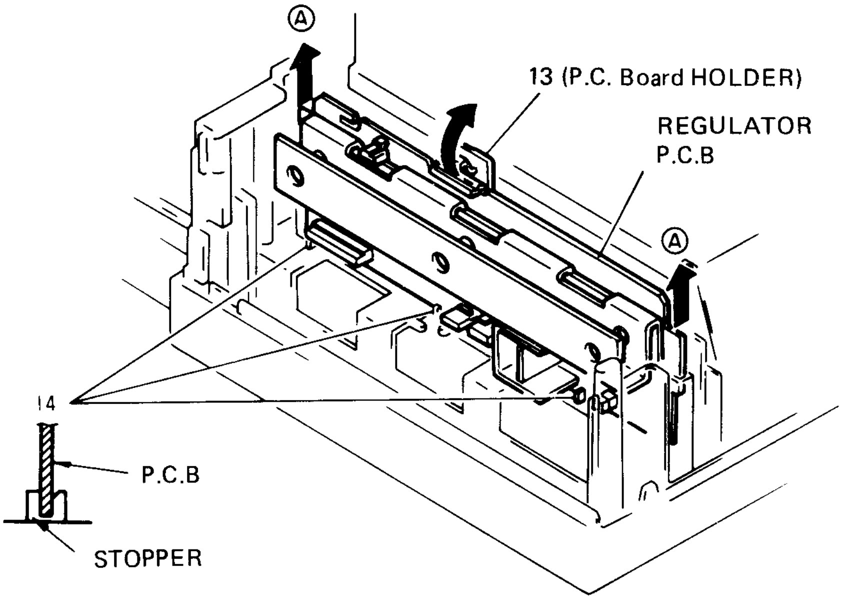

Ⓐ
13 (P.C. Board HOLDER)
REGULATOR
P.C.B
Ⓐ
14
P.C.B
STOPPER

Fig. 14

2-8 RF converter PC Board (Fig. 15)

① Remove the bottom cover. (Item 1-3)

② Pull the cover in the direction of arrow (B) to remove it while pushing the stopper (15) of the RF converter cover in the direction of arrow (A).

③ Remove the 1 connector (16) and the RF cable (17) to take out the RF converter.

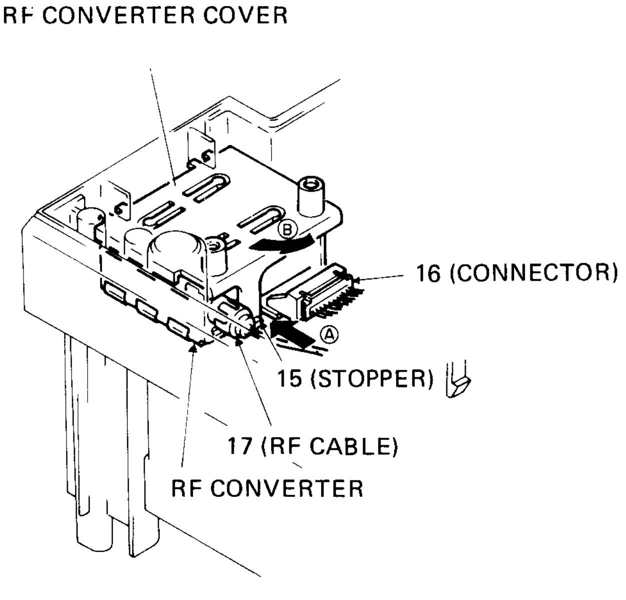

RF CONVERTER COVER
Ⓑ
16 (CONNECTOR)
Ⓐ
15 (STOPPER)
17 (RF CABLE)
RF CONVERTER

Fig. 15

2-9 System control/Servo PC Board, Y/Chroma/Audio PC Board

1 Remove the top cover. (Item 1-2)

2 Remove the bottom cover. (Item 1-3)

3 Remove the front panel. (Item 1-4)

4 Remove the 7 screws (18).

5 After releasing the 2 stoppers (19), lift up the PC Board in the direction of the arrow to open it.

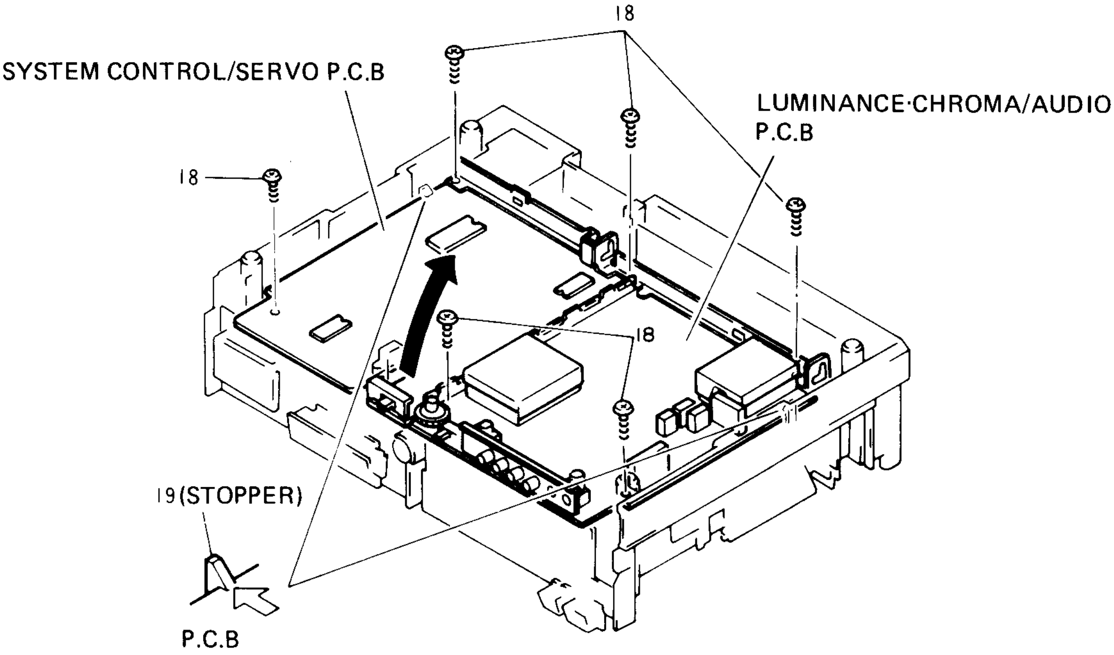
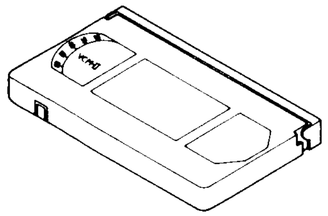

18
SYSTEM CONTROL/SERVO P.C.B
LUMINANCE·CHROMA/AUDIO P.C.B
18
18
19(STOPPER)
P.C.B

Fig. 16

SERVICING JIGS AND TOOLS

1



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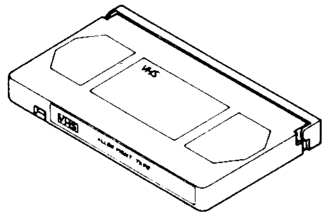
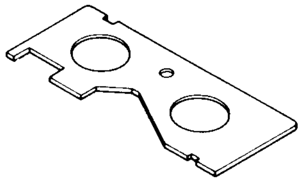
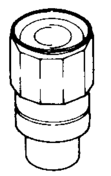


3



4



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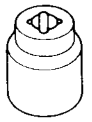

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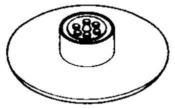

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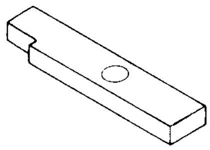

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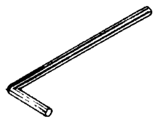
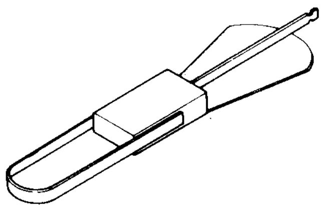


9



ITEM	PARTS NAME	PARTS NO.
1.	Back tension meter	7099004
2.	Alignment tape	7099046
3.	Height reference plate (Master plane)	7099041
4.	Torque gauge	7099039
5.	Torque gauge adaptor	7099035
6.	Dummy reel	7099043
7.	Reel disk height jig	7099001
8.	1.5 mm hexagonal wrench	———
9.	Fan type tension gauge	———

3. Names and locations of main chassis parts

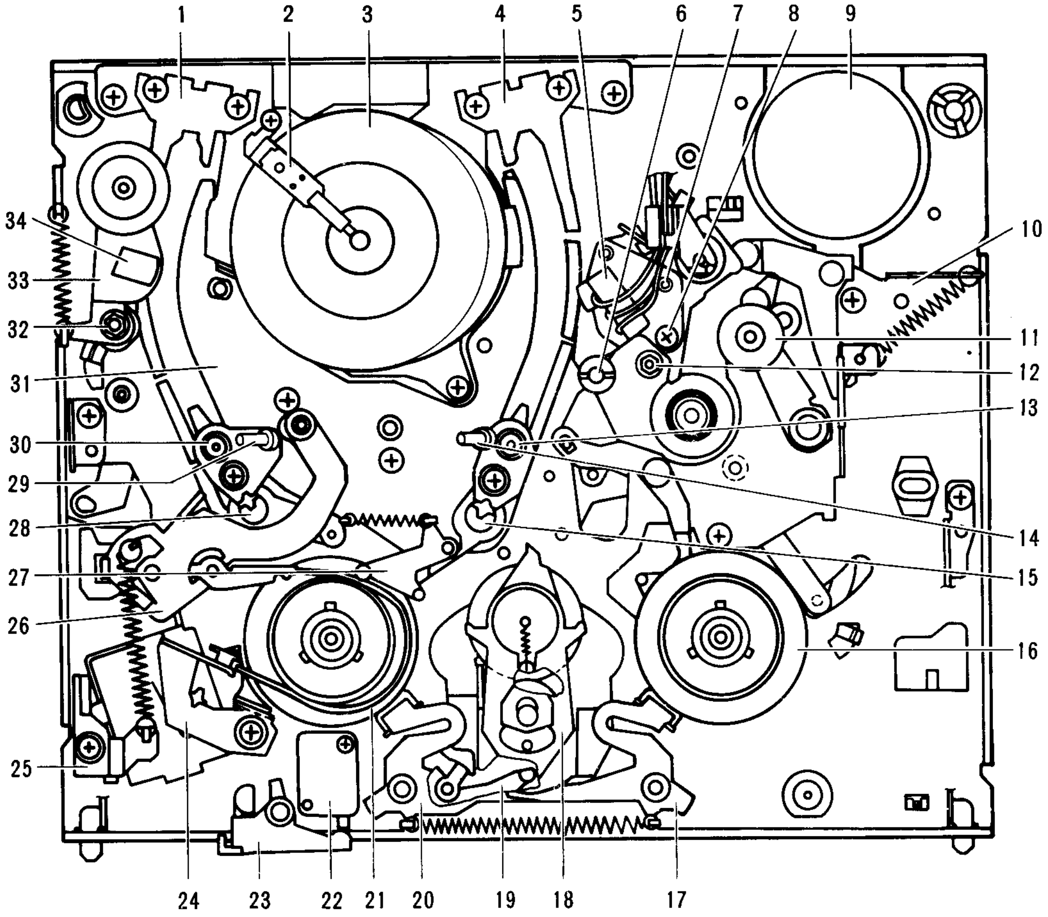


Fig. 20

1. Catcher (Supply)
2. Cylinder motor brush
3. Video head (Upper cylinder)
4. Catcher (Take-up)
5. AC head (Audio control head)
6. X value adjusting screw
7. Tilt adjusting screw
8. Azimuth adjusting screw
9. Capstan motor ass'y
10. Arm braket ass'y
11. Pressure roller ass'y
12. Guide pole (Tape guide)
13. Guide roller (Take-up)
14. Inclined guide (Take-up)
15. Guide roller base (Take-up)
16. Take-up reel disk
17. Main brake (Take-up)
18. FF/REW idler arm ass'y
19. Brake conversion arm
20. Main brake (Suppiy)
21. Supply reel disk
22. Safety tab switch
23. Record prevention arm
24. Tension band ass'y (Tension band, tension bracket)
25. Spring holder (Spring hanger)
26. Tension arm
27. Sub-brake

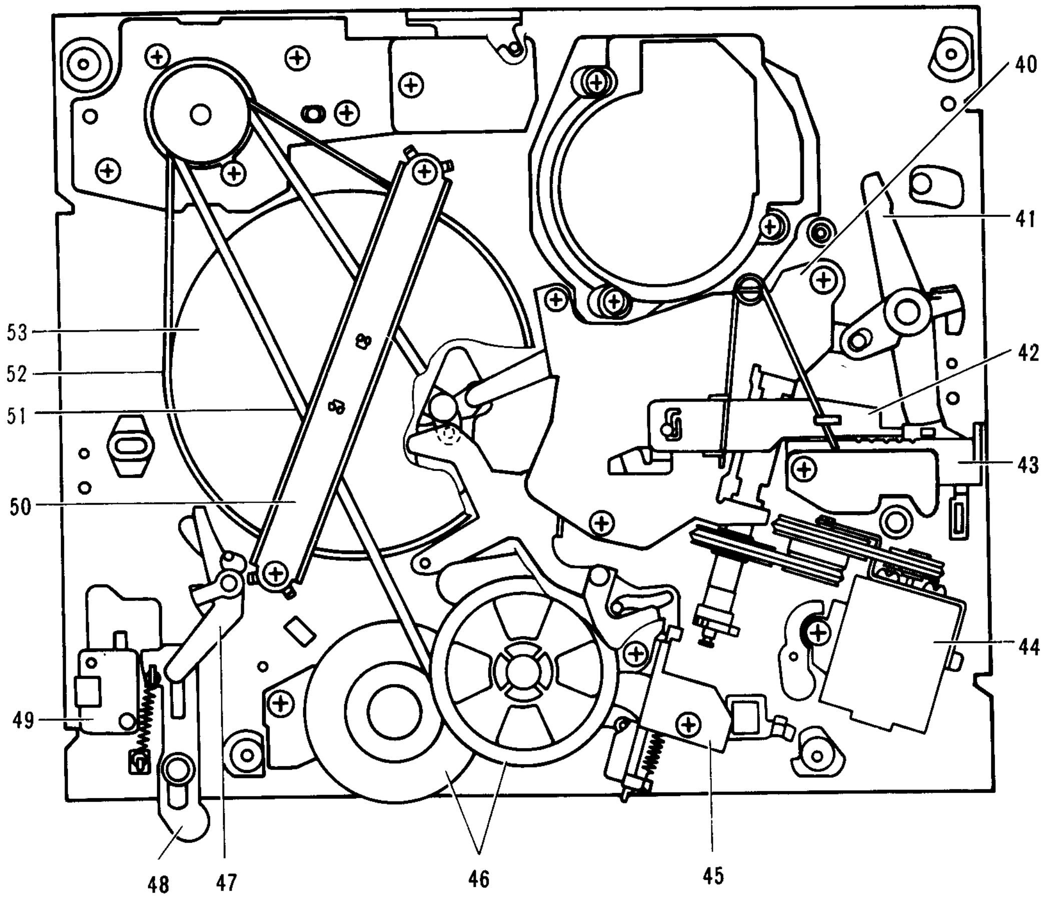


Fig. 21

28. Guide roller base (Supply)
29. Inclined guide (Supply)
30. Guide roller (Supply side)
31. Guide base clamp plate
32. Guide pole (Supply side)
33. Impedance roller arm ass'y
34. FE head (Full erase head)
40. Loading gear ass'y
41. Tension release arm 2
42. Mode slider
43. Mechanism state switch
44. Loading motor ass'y
45. Brake slider ass'y
46. Clutch plate ass'y
47. Eject hold arm
48. Eject holder switch
49. Cassette holder switch
50. Flywheel support plate
51. Reel belt
52. Flywheel belt
53. Flywheel ass'y

4. Before disassembling parts

The parts shown below are fixed in the factory using precision jigs so be sure not to loosen their screws or remove them.

1) Take-up/supply catchers and fixing screws.
2) Inclined guide and its fixing screws.
   Do not turn the adjusting screws shown below when removing adjacent parts.
3) Take-up/supply guide pole height adjusting nut.
4) Take-up/supply guide roller height adjusting nut.
5) AC head X value adjusting screw.
6) AC head tilt adjusting screw.
7) AC head azimuth adjusting screw.
8) AC head height adjusting nut.
9) Back tension adjusting spring holder fixing screw.
10) Tension band fixing screw.

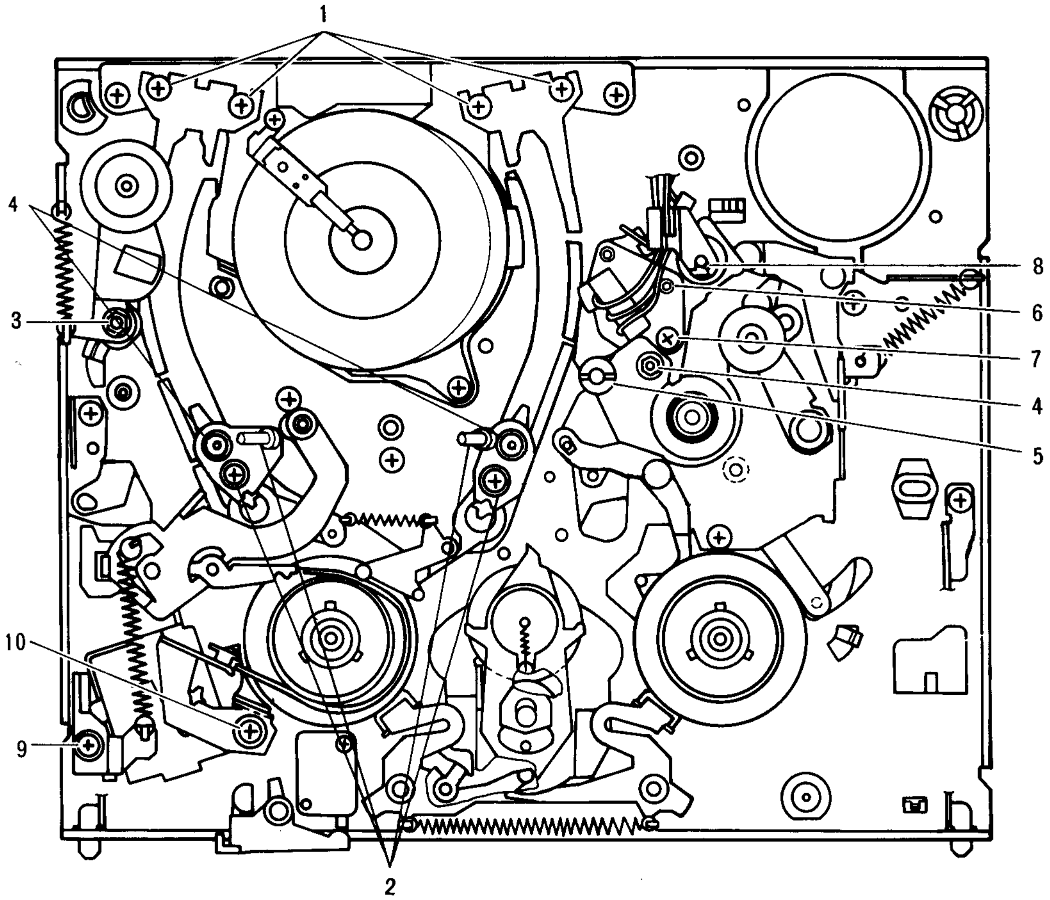


Fig. 22

5. Removing PC Boards

5-1 End sensor circuit board (Fig. 23)

① Remove the cassette holder. (Refer to Item 6-1)
② Pull out the end sensor circuit board upward.

5-2 End lamp circuit board (Fig. 23)

① Open the cassette holder. (Refer to Item 6-1)
② Remove 1 screw (2).

5-3 Safety tab switch circuit board (Fig. 23)

① Remove the cassette holder. (Refer to Item 6-1)
② Remove 1 screw (3).
③ Remove the connector (4).

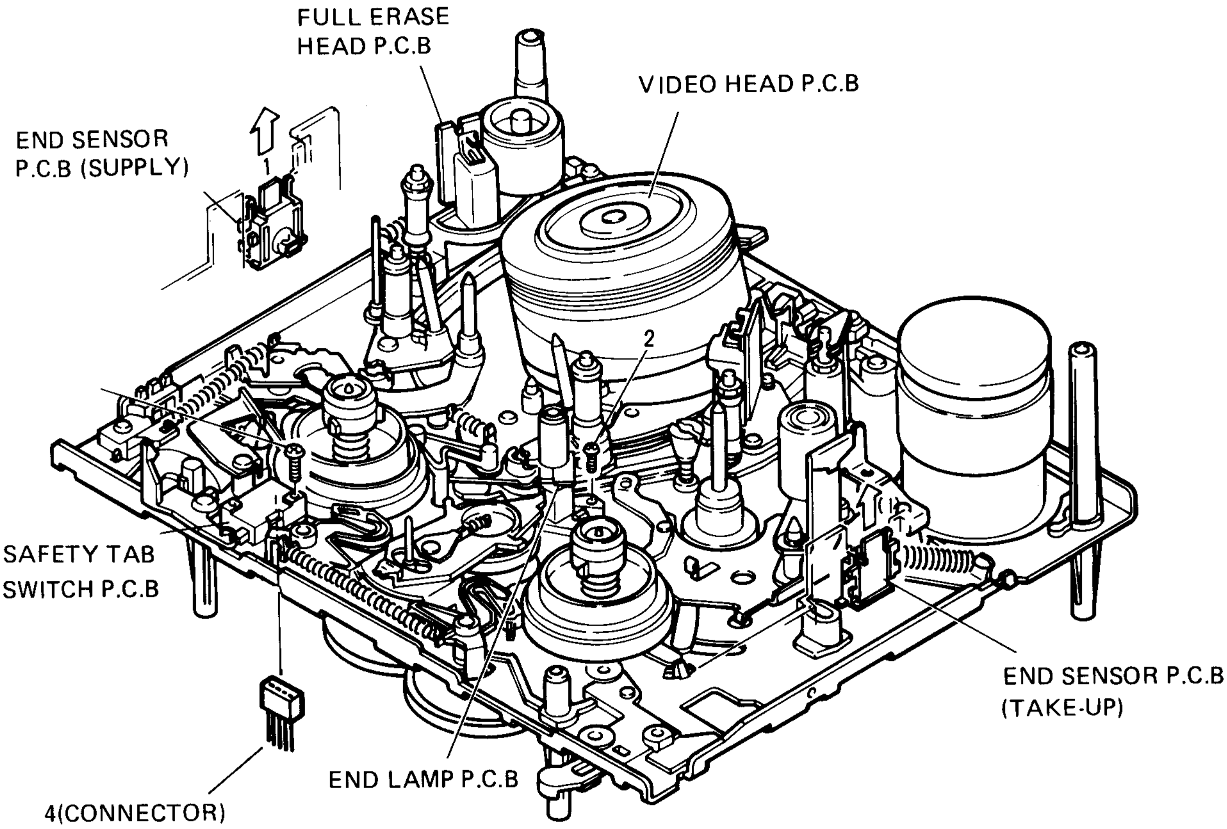

FULL ERASE HEAD P.C.B
VIDEO HEAD P.C.B
END SENSOR P.C.B (SUPPLY)
1
2
SAFETY TAB SWITCH P.C.B
END SENSOR P.C.B (TAKE-UP)
END LAMP P.C.B
4(CONNECTOR)

Fig. 23

5-4 Cylinder motor circuit board (Fig. 24)

① Remove 2 screws (5).

5-5 Reel sensor circuit board (Fig. 24)

① Remove 1 screw (6).

5-6 Cassette holder switch (Fig. 24)

① Remove 1 screw (7).

② Remove the connector (8).

5-7 Mechanism state switch circuit board (Fig. 24)

① Remove the 1 screw mechanism state switch fixing screw (9).

* Install the mechanism state switch circuit board by the procedure reverse to disassembly. Adjust the mechanism state switch installation position after it is installed. (Refer to Item 8-1)

5-8 Capstan motor circuit board (Fig. 24)

① Remove the capstan motor circuit board fixing screw (10).

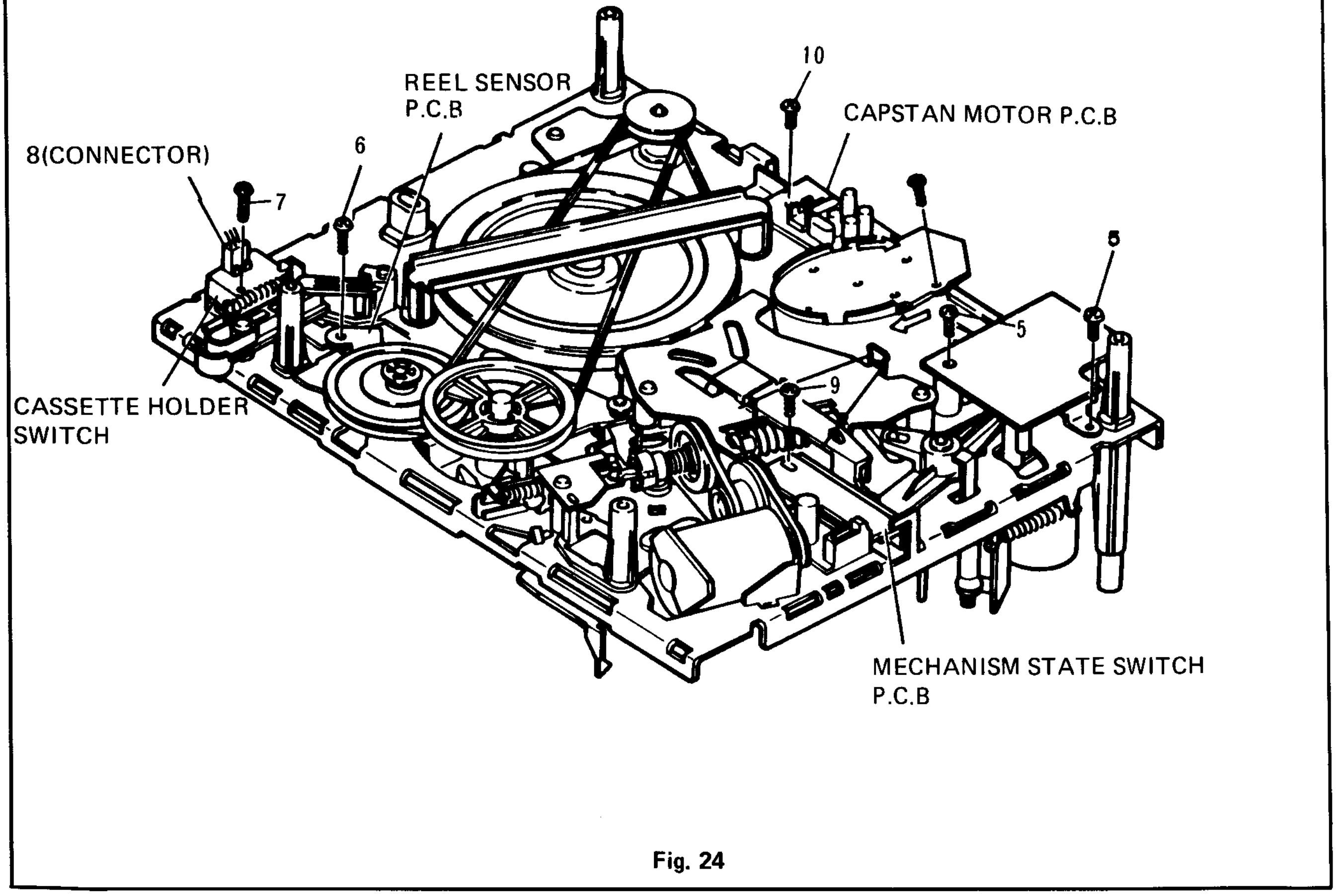

REEL SENSOR
P.C.B
10
CAPSTAN MOTOR P.C.B
8(CONNECTOR)
6
7
5
5
9
CASSETTE HOLDER
SWITCH
MECHANISM STATE SWITCH
P.C.B

Fig. 24

6. Removing main parts

6-1 Cassette holder (Fig. 25)

(1) Remove 2 cassette lid fixing screws (1) to remove the cassette lid.

(2) Press the eject button to open the cassette holder.

(3) Remove the safety tab switch lever (2).

(4) Remove 2 cassette holder fixing screws (3).

(5) Remove the cassette holder. Lift the cylinder side of the cassette holder first at this time.

* Install the cassette holder by the procedure reverse to disassembly. Check the opening/closing operation of the cassette holder, and the operation of the safety tab switch and cassette holder switch after installation is completed.

6-2 Cylinder motor (Figs. 26-1, 26-2, 26-3)

The service parts of the cylinder motor are set as follows.

1 Video head (Upper cylinder)
2 Fixed (lower) cylinder ass'y
3 Transformer terminal
4 Stator circuit board ass'y
5 Rotor magnet ass'y
6 FG circuit board ass'y

The replacement procedure for each part is described in the following.

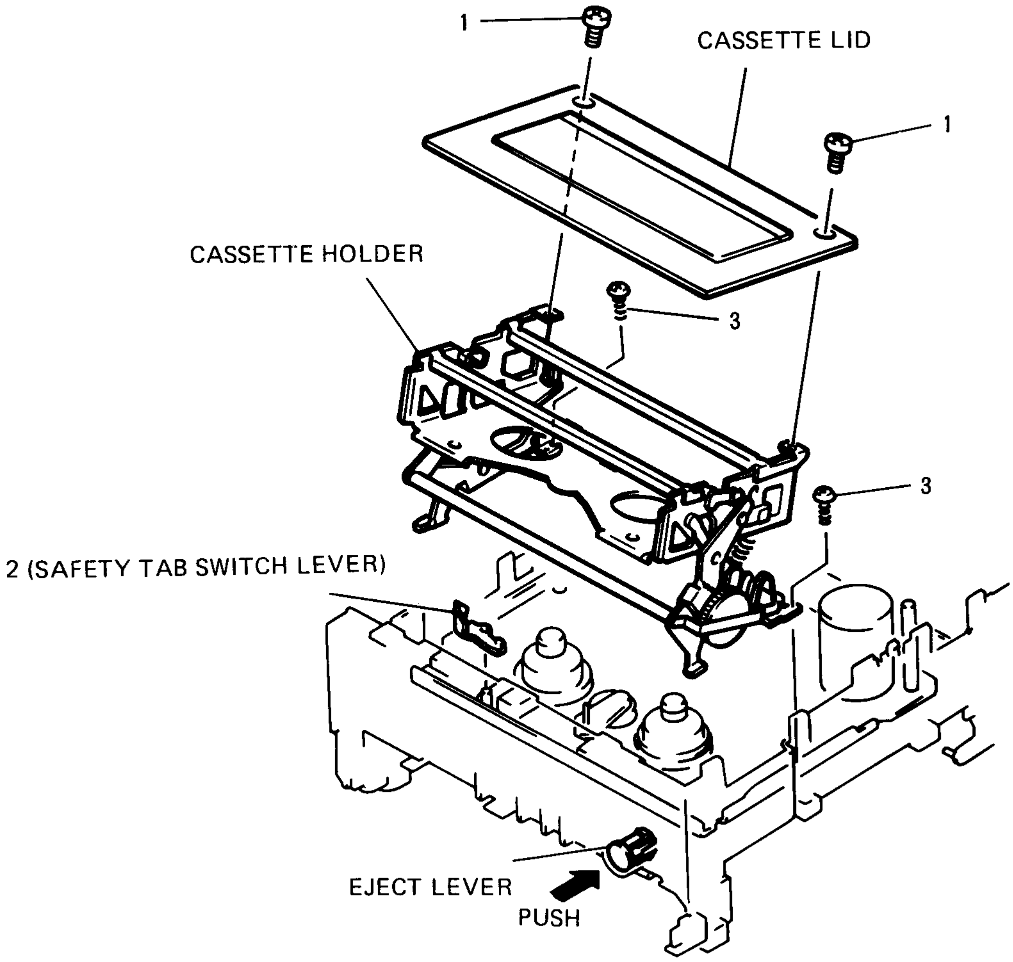


Fig. 25

(1) Video head (Upper cylinder) (Figs. 26-1, 26-2)

① Remove the brush fixing screw (4).

② Remove 4 video head leads (5-1) shown in Fig. 26-2.

③ Remove 2 video head fixing screws (6) and pull out the video head.

* Install the video head by the procedure reverse to disassembly. Check the following after installing it.

(1) Tighten 2 video head fixing screws (6) shown in Fig. 26-1 alternately. Be careful not to touch the video head tip with a finger or tool.

(2) Check that the leads of the rotary transformer shown in Fig. 26-2 and the lead colors marked on the relay PC Board match when soldering the leads after replacing the video head.

(3) Clean the tape touching section of the cylinder using alcohol, etc. after installing the video head.

(4) Check the output of the FM signal. (Refer to the item "Transport system adjustment" in "Mechanism adjustment").

(5) Check the record level of the Y/chroma signals. (Refer to the item "Record current adjustment" in "Circuit adjustment").

(6) Check the switching point of the video head. (Refer to the item "switching point (CH1, CH2 PHASE) adjustment" in "Circuit adjustment").

(7) Check that the FM signal is max. with the tracking VR set to the center (click) position.
(Refer to the item "Tracking preset adjustment" in "Circuit adjustment").

(2) Fixed cylinder (lower cylinder) (Fig. 26-1)

① Remove the cylinder motor circuit board. (Refer to Item 5-4)

② Remove 3 connectors (7).

③ Remove 1 connector (8).

④ Remove 4 lower cylinder fixing screws (9), and then remove the fixed cylinder (lower cylinder) from the top of the chassis.

⑤ Remove the video head (upper cylinder).

* Install the fixed cylinder (lower cylinder) by the procedure reverse to disassembly. When the video head (upper cylinder) is removed, electrically check and adjust it according to the procedure described previously in the item "Video head installation method".

(3) Transformer terminal

Transformer terminals play the role of the guides which lead the leads of the rotary transformer to the video head (upper cylinder). When the leads are cut and shortened and soldering them to the relay circuit board is not possible, replace the transformer terminals.

1 Remove the video head. (Refer to item (1)).

2 Unsolder the leads (5-2) soldered to the relay circuit board for the fixed head.

3 Pull out the transformer terminals.

* Install the transformer terminals by the procedure reverse to disassembly. Check that the lead colors and color names stamped on the relay circuit board on the rotary transformer match at that time.

(4) Rotary magnet ass'y (Fig. 26-3)

Do not allow the rotary magnet to be attracted by other magnetic or iron materials because it is magnetized with high precision to maintain the precise rotation of the motor. When it is attracted by mistake, there is danger that its magnetization may be changed. Pay special attention in handling the FG signal generating magnet installed to the back of the rotary magnet because the number of poles is 60 and magnetizing force is weak.

① Remove the stator circuit board fixing screw (10).

② Turn the stator circuit board clockwise to remove the stator ass'y.

③ Remove the motor case fixing screw (11).

④ Turn the motor case clockwise to remove it.

⑤ Remove 2 rotor magnet fixing screws (12) shown in Fig. 26-3.

⑥ Remove the rotor magnet. Be careful not to apply unreasonable force to the cylinder sharft at that time.

* Install the rotor magnet by the procedure reverse to disassembly. Check items shown below at that time.

(1) The installation position regulating convex section is provided near the hole in the rotor magnet into which the shaft is inserted, to adjust the installation position. Install the rotor magnet so that this convex section enters the concave section provided in the shaft.

(2) Check the switching point of the video head after installing the rotor magnet.
(Refer to the item "Switching point adjustment" in "Circuit adjustment").

(5) FG PC Board ass'y (Fig. 26-1)

① Remove the stator circuit board.
② Remove the rotor magnet.
③ Remove the motor case fixing screw (11).
④ Turn the motor case clockwise to remove it.
⑤ Remove 3 FG PC Board fixing screws (13).

* Install the FG PC Board ass'y by the procedure reverse to disassembly. Refer to the item "Rotor Magnet" for the installation procedure of the rotor magnet and electrical adjustment and checking after installation.

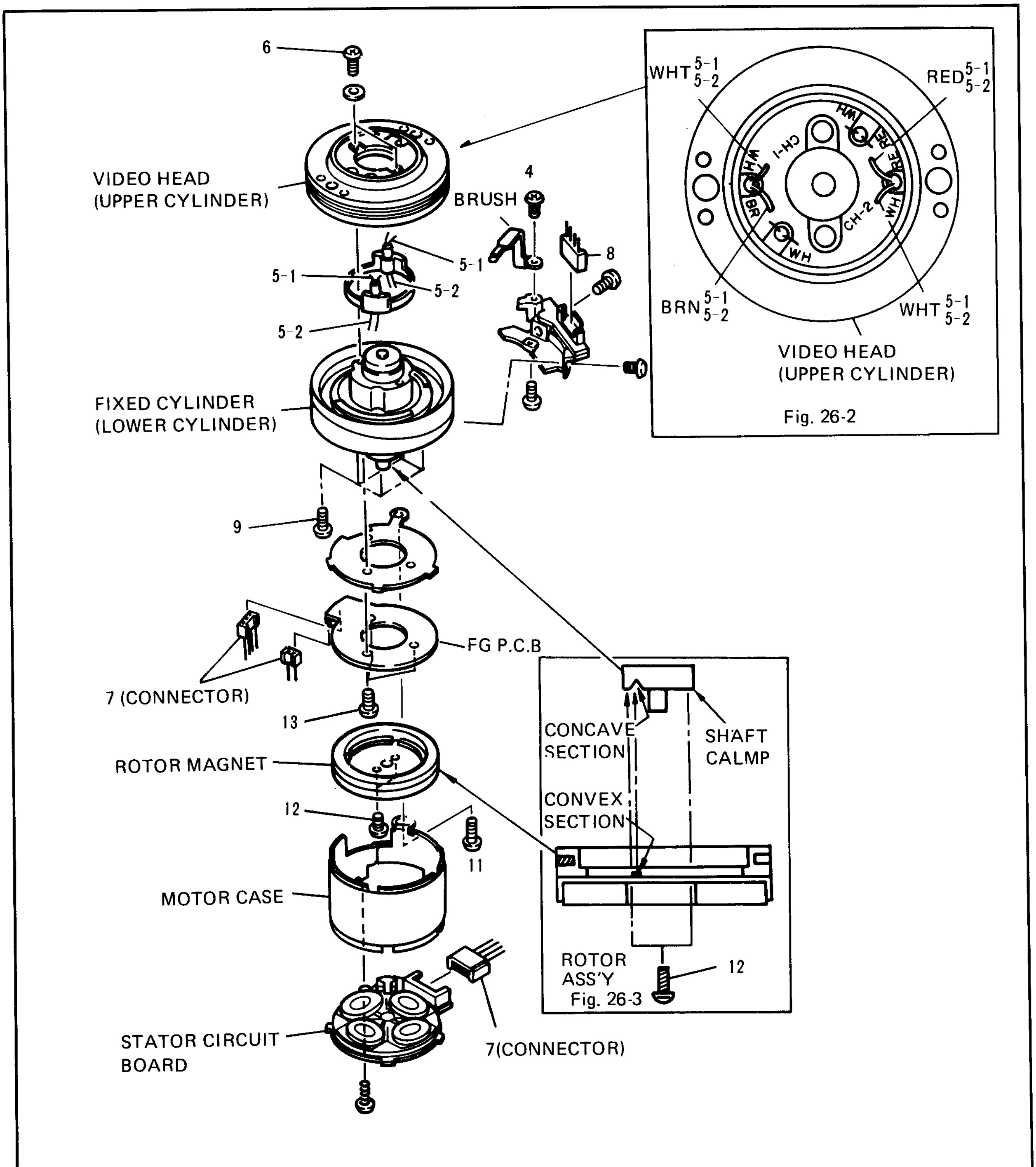

6
VIDEO HEAD
(UPPER CYLINDER)
4
BRUSH
5-1
5-2
8
5-1
5-2
FIXED CYLINDER
(LOWER CYLINDER)
9
FG P.C.B
7 (CONNECTOR)
13
ROTOR MAGNET
12
11
MOTOR CASE
STATOR CIRCUIT
BOARD
7(CONNECTOR)
WHT 5-1 5-2
RED 5-1 5-2
CH-1
CH-2
WH
RE
BR
BRN 5-1 5-2
WHT 5-1 5-2
VIDEO HEAD
(UPPER CYLINDER)
CONCAVE
SECTION
SHAFT
CALMP
CONVEX
SECTION
ROTOR
ASS'Y
12

Fig. 26-2

Fig. 26-3

Fig. 26-1

6-3 Loading motor ass'y (Fig. 27)

① Remove the loading belt.

② Remove the connector (14).

③ Remove the bracket fixing screw (15) and remove the loading motor.

* Install the loading motor by the procedure reverse to disassembly.

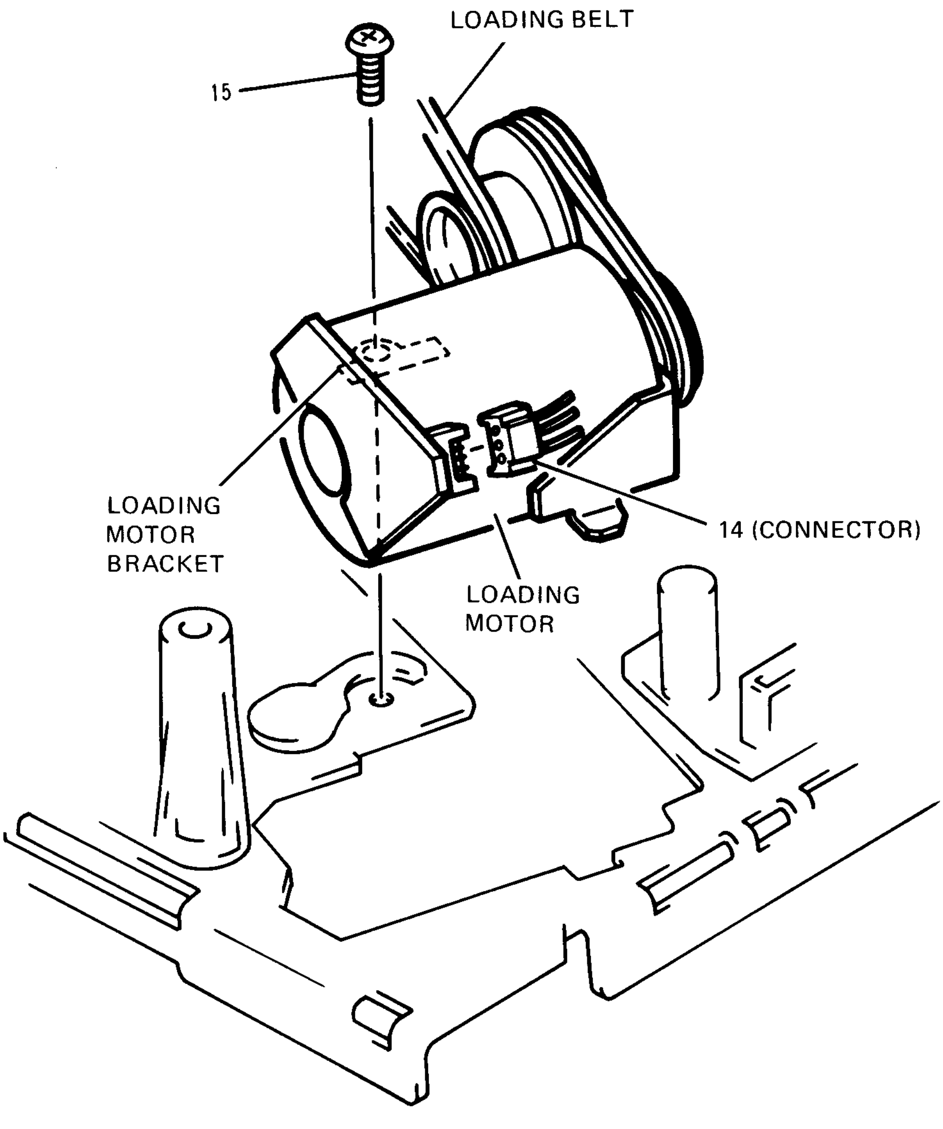

LOADING BELT
15
LOADING
MOTOR
BRACKET
14 (CONNECTOR)
LOADING
MOTOR

Fig. 27

6-4 Capstan motor (Fig. 28)

① Remove the reel belt.
② Remove the flywheel belt.
③ Remove 2 capstan motor holder fixing screws (16).
④ Lift the capstan motor ass'y (motor, holder, circuit board) in the direction of the arrow.

* Install the capstan motor by the procedure reverse to disassembly. Check twisting, etc. after installing the reel belt.

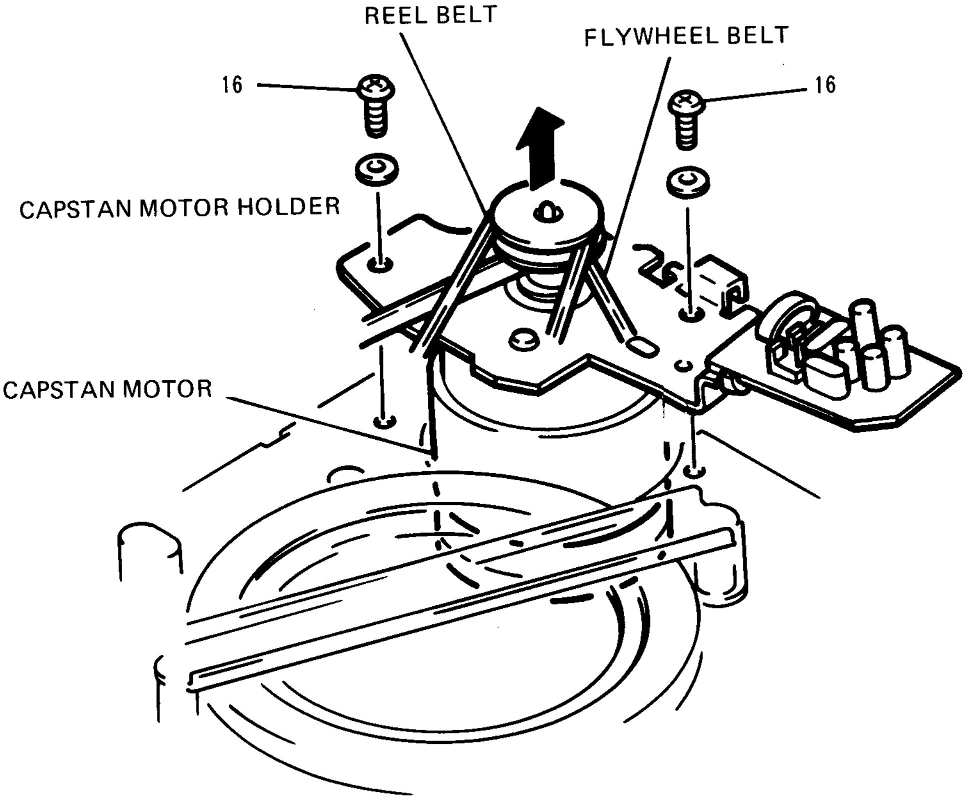

REEL BELT
FLYWHEEL BELT
16
16
CAPSTAN MOTOR HOLDER
CAPSTAN MOTOR

Fig. 28

6-5 Flywheel (Fig. 29)

① Remove 2 flywheel support plate fixing screws (17) to remove it.

③ Pull out the Flywheel in the direction of the arrow.

* Install the flywheel by the procedure reverse to disassembly.
Insert the washer (18) into the capstan shaft from the top of chassis.

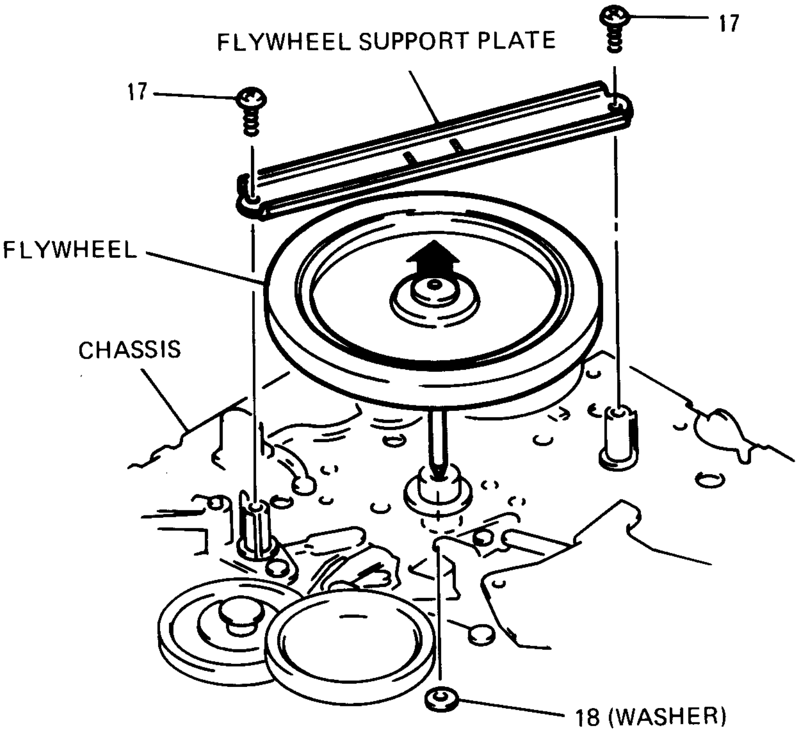

17
FLYWHEEL SUPPORT PLATE
17
FLYWHEEL
CHASSIS
18 (WASHER)

Fig. 29

6-6 FF/REW idler arm ass'y (Fig. 30)

1 Move the spring holder (19) in the direction of the arrow to remove it.

2 Pull out the FF/REW idler ass'y in the direction of the arrow.

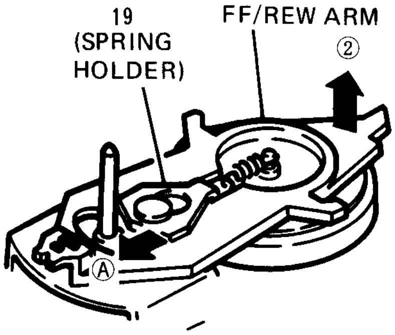

19
(SPRING
HOLDER)
FF/REW ARM
②
Ⓐ

Fig. 30

6-7 Clutch plate ass'y (Fig. 31)

① Remove the FF/REW idler arm ass'y. (Refer to Item 6-6)

② Remove 2 clutch plate fixing screws (20).

③ Press the main brake arms (supply side and take-up side) and the brake conversion arm in the direction of arrow (A) to release their engagement and lift the cluth plate ass'y in the direction of arrow (B) to remove it.

* Install the clutch plate ass'y by the procedure reverse to disassembly.

6-8 Brake slider ass'y (Fig. 31)

① Remove the FF/REW idler arm ass'y. (Refer to Item 6-6)

② Remove the brake slider ass'y fixing screw (21).

③ Install the brake slider ass'y by the procedure reverse to disassembly.

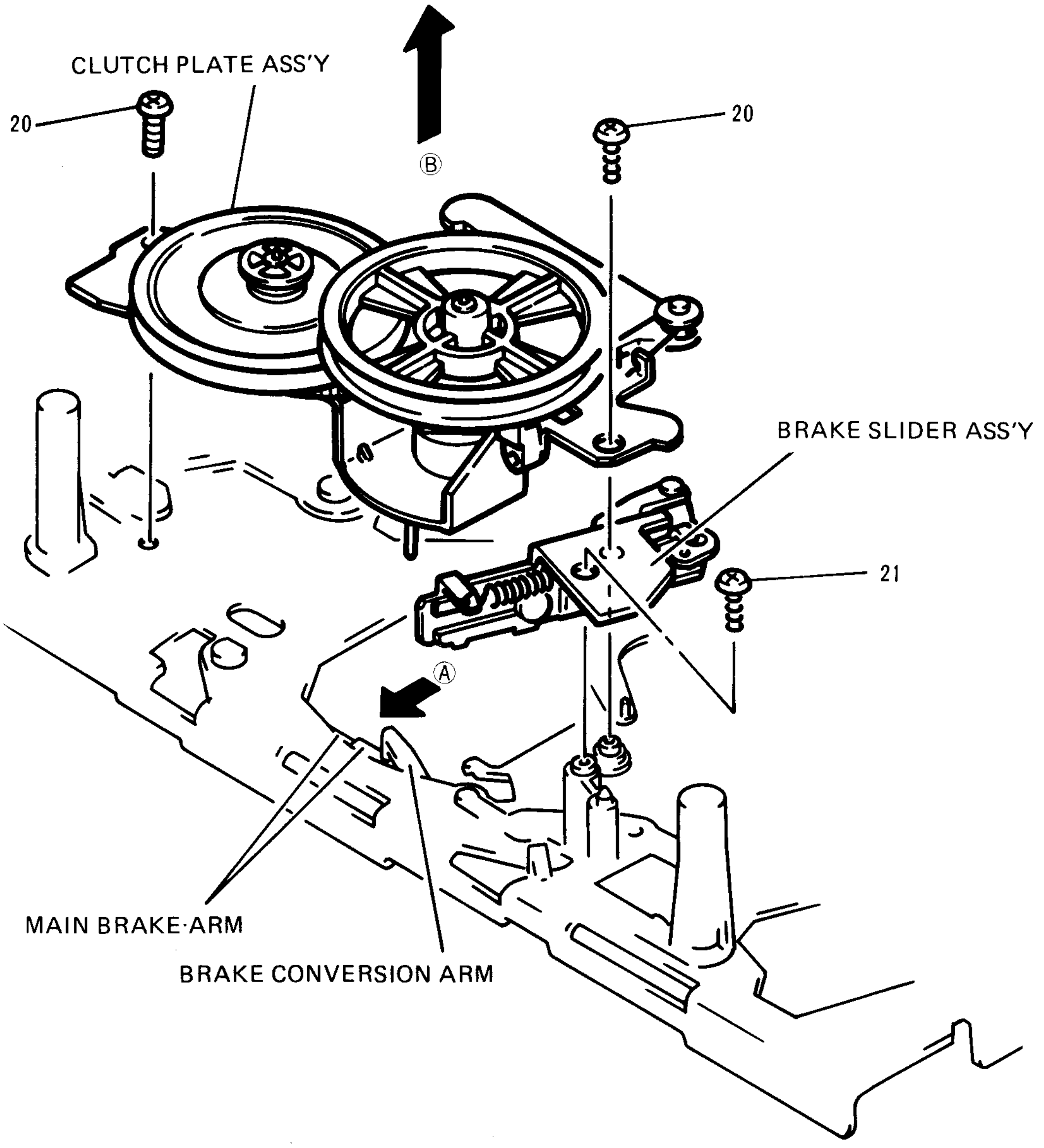

CLUTCH PLATE ASS'Y
20
20
Ⓑ
BRAKE SLIDER ASS'Y
21
Ⓐ
MAIN BRAKE·ARM
BRAKE CONVERSION ARM

Fig. 31

6-9 Loading gear ass'y (Fig. 32, Fig. 33)

① Turn the loading pulley (shown in Fig. 33) fully in the direction of unloading (direction of the arrow (A)) by band to set the chassis to the unloading mode.

② Remove the mechanism state switch circuit board. (Refer to Item 5-7)

③ Remove the clutch plate ass'y. (Refer to Item 6-7)

④ Remove the brake slider ass'y. (Refer to Item 6-8)

⑤ Remove 3 loading gear ass'y fixing screws (22) shown in Fig. 33.

⑥ Remove 2 guide base clamp plate fixing screws (23) shown in Fig. 32.

⑦ Remove the T release arm while pressing the stopper shown in Fig. 33.

⑧ Remove the loading gear ass'y.

* Install the loading gear ass'y by the procedure reverse to disassembly. Install it while paying attention to the items shown below and the linked sections shown in Fig. 33.

(1) The loading gear shaft should be inserted into the hole in the loading link.

(2) The operation arm shaft should be inserted into the hole in the prossure roller shaft.

(3) The shaft of the T release arm 1 should be inserted into the hole in the T release arm 2.

(4) The shaft of drive arm should be inserted into the hole in the coupling piece.

(5) Check and adjust the installation position of the mechanism state switch after installing it.
(Refer to Item 8-1).

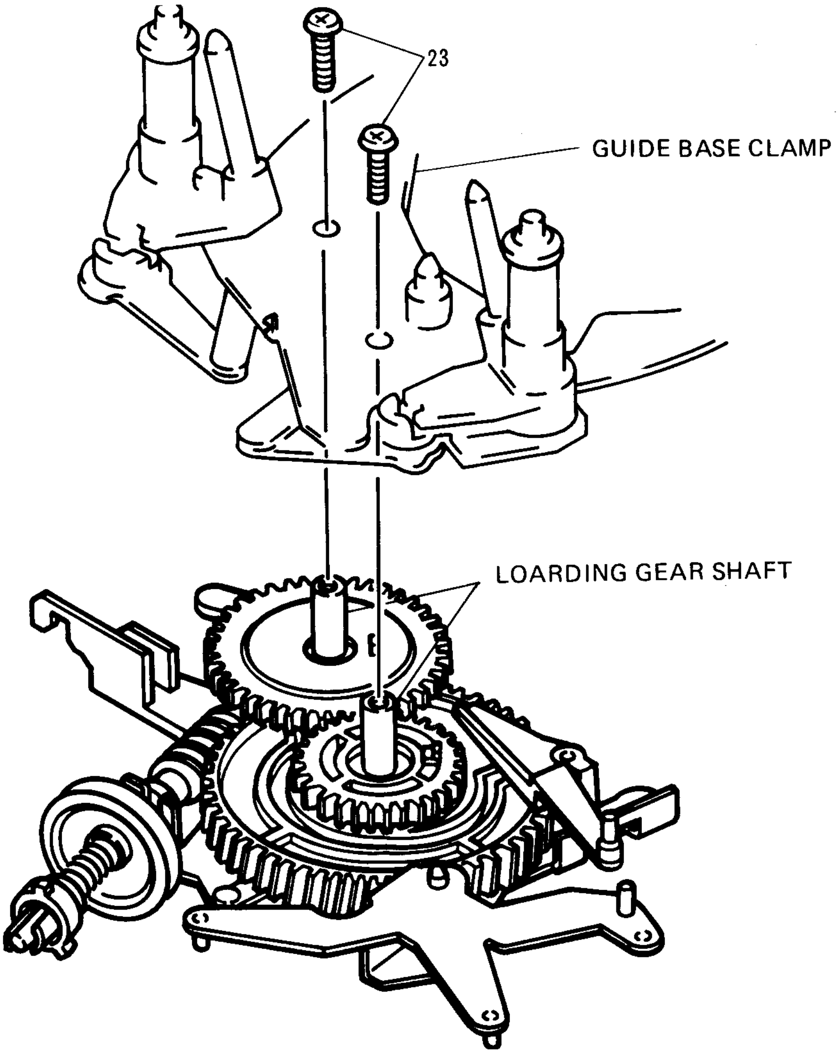
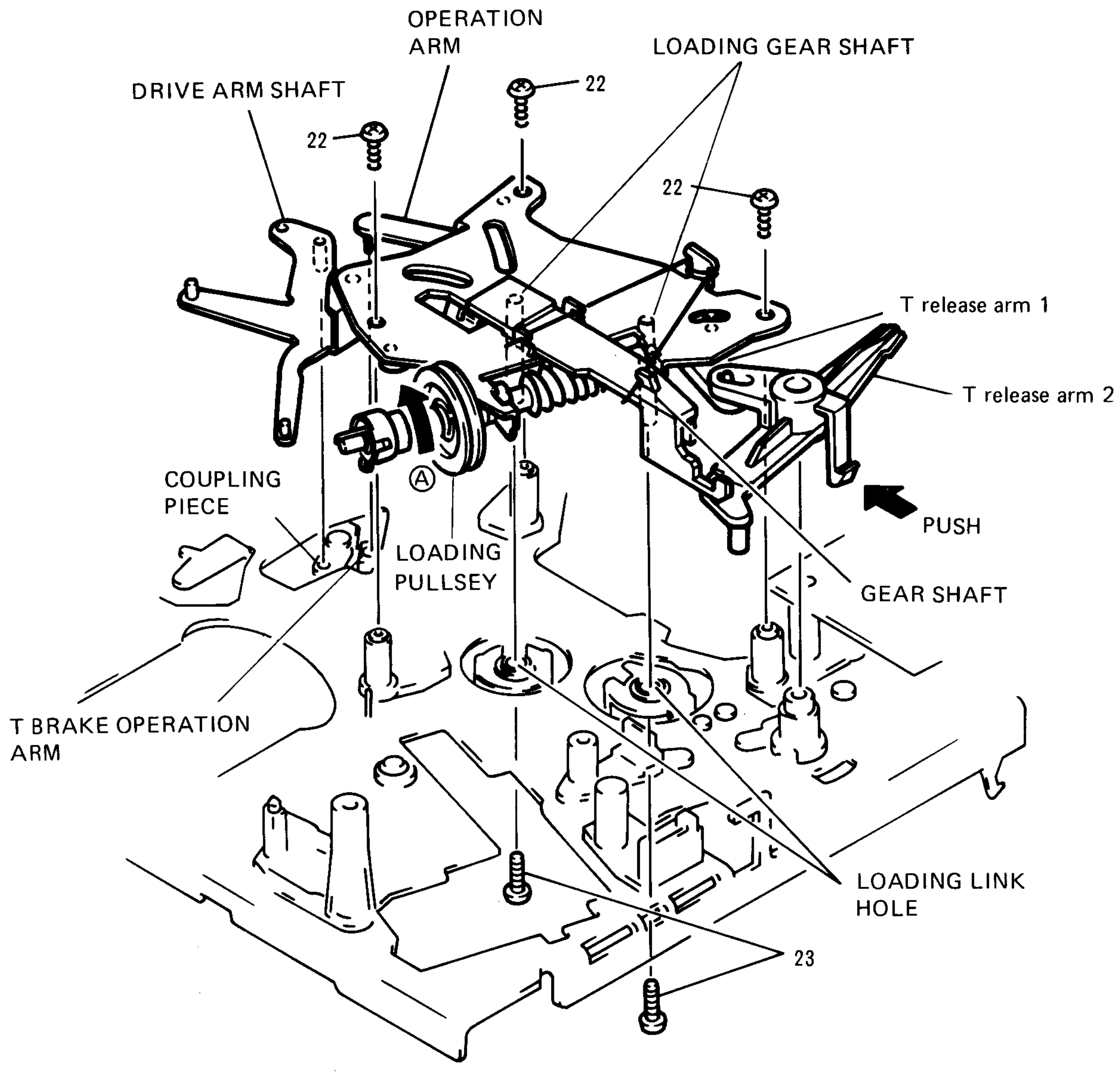


Fig. 32



OPERATION ARM
DRIVE ARM SHAFT
22
22
LOADING GEAR SHAFT
22
T release arm 1
T release arm 2
PUSH
COUPLING PIECE
Ⓐ
LOADING PULLSEY
GEAR SHAFT
T BRAKE OPERATION ARM
LOADING LINK HOLE
23

Fig. 33

6-10 Tension band/tension arm ass'y (Fig. 34)

Tension band

① Remove the cassette holder. (Refer to Item 6-1)
② Remove the tension band fixing screw (24).
③ Press the stopper Ⓐ of the tension band felt to release engagement between the tension band and tension felt, and then remove the tension band.

Tension arm

① Remove the tension band.
② Remove the spring (25).
③ Pull out the tension arm upward while pressing the stopper Ⓑ.

* Install the tension band/tension arm ass'y by the procedure reverse to disassembly. Adjust the position of the tension pole and tension after installation is completed. (Refer to the item "Transport system adjustment" in "Mechanism adjustment").

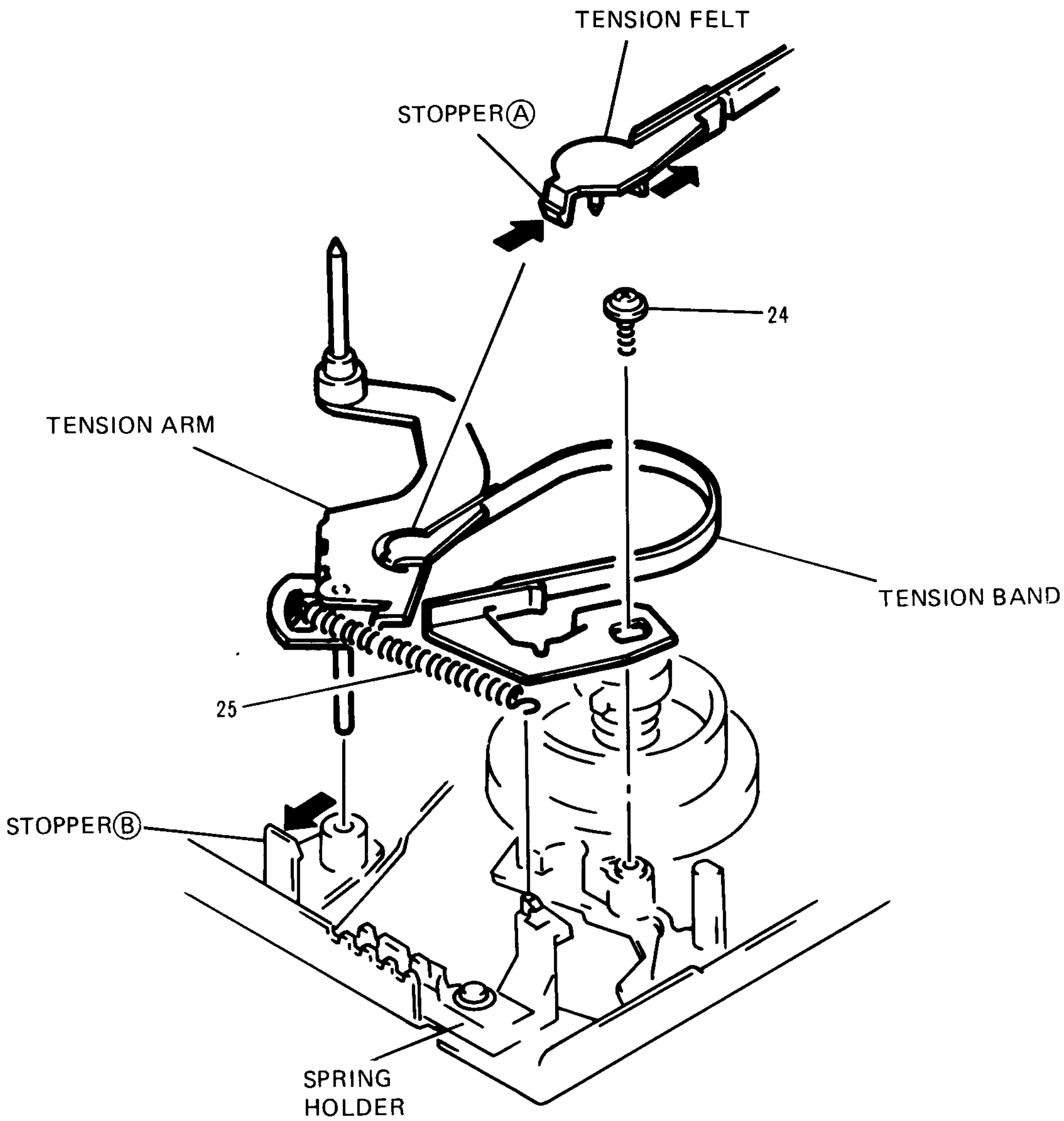

TENSION FELT
STOPPERⒶ
24
TENSION ARM
TENSION BAND
25
STOPPERⒷ
SPRING HOLDER

Fig. 34

6-11 Take-up reel disk/supply reel disk (Fig. 35).

① Remove the cassette holder. (Refer to Item 6-1)

② Remove the washer (26) shown in Fig. 35.

6-12 Pressure roller arm bracket ass'y (Fig. 35)

Pressure roller

① Remove the pressure roller fixing screw (27).

Pressure roller arm

② Remove the pressure roller arm fixing washer (28).

Arm bracket ass'y

① Remove the cassette holder. (Refer to Item 6-1)

② Remove the take-up reel disk. (Refer to Item 6-11)

③ Remove the pressure roller arm.

④ Remove 2 arm bracket fixing screws (29).

* Install the pressure roller ass'y by the procedure reverse to disassembly, taking care of connections below and shown in Fig. 33.

(1) The operation arm shaft should be inserted into the hole in the T brake operation arm.

(2) The drive arm shaft should be inserted into the hole in the coupling piece.

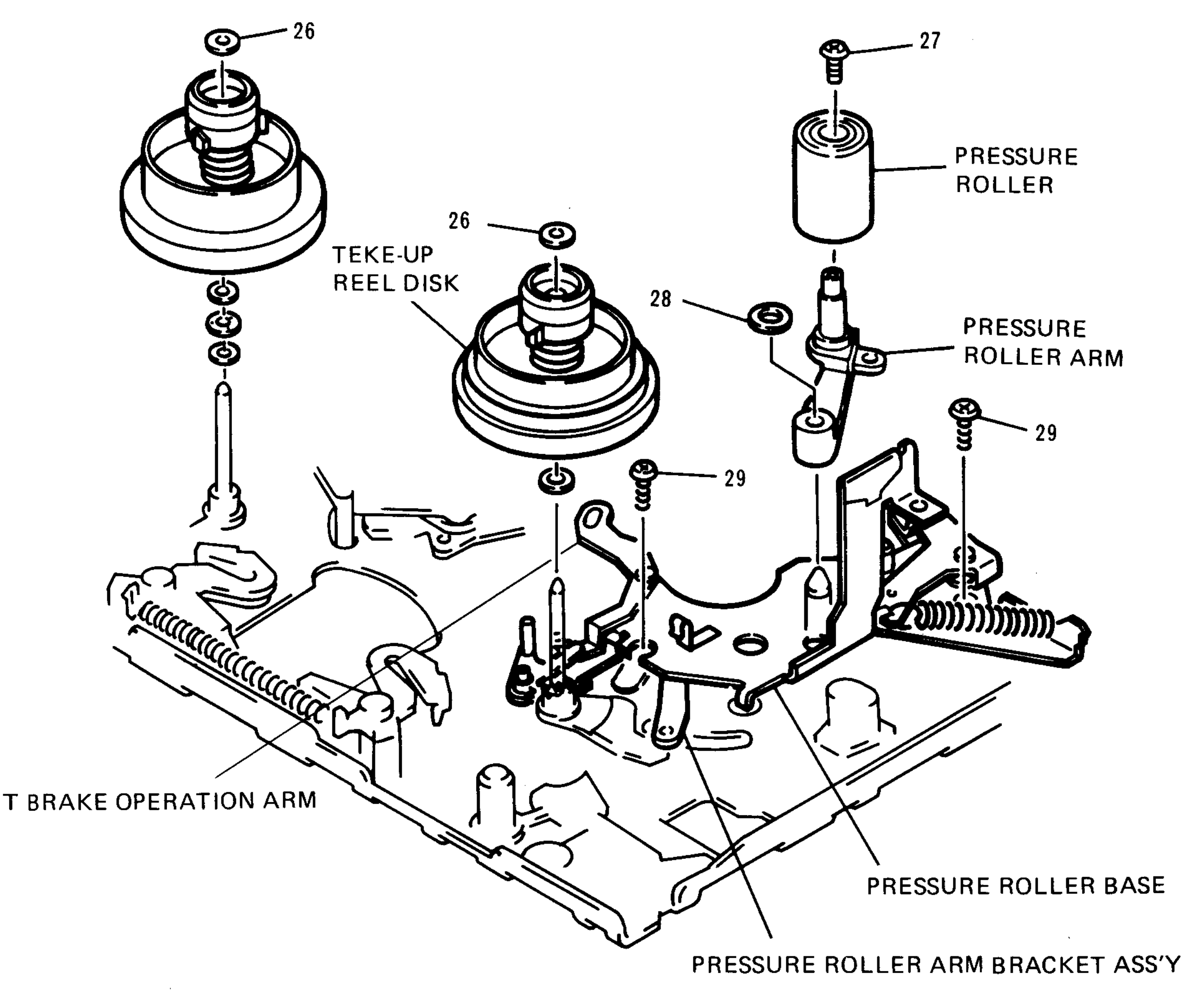

26
27
PRESSURE ROLLER
26
TEKE-UP REEL DISK
28
PRESSURE ROLLER ARM
29
29
T BRAKE OPERATION ARM
PRESSURE ROLLER BASE
PRESSURE ROLLER ARM BRACKET ASS'Y

Fig. 35

6-13 Guide pole (Fig. 36)

① Remove the nut (30).

② Remove the guide pole.

* Adjust the height of the guide pole after installing the guide pole. (Refer to the item 8-2)

6-14 FE head (full erase head) (Fig. 36)

① Remove the guide pole. (Refer to Item 6-13)

② Remove the spring (31).

③ Remove the spring (32) from the impedance roller.

④ Pull out the impedance roller ass'y in the direction of the arrow.

⑤ Remove the FE head fixing screw (33) shown in Fig. 36.

* Install the impedance roller arm ass'y/FE head by the procedure reverse to disassembly, and adjust the height of the tape guide after installation is completed. (Refer to the item 8-2)

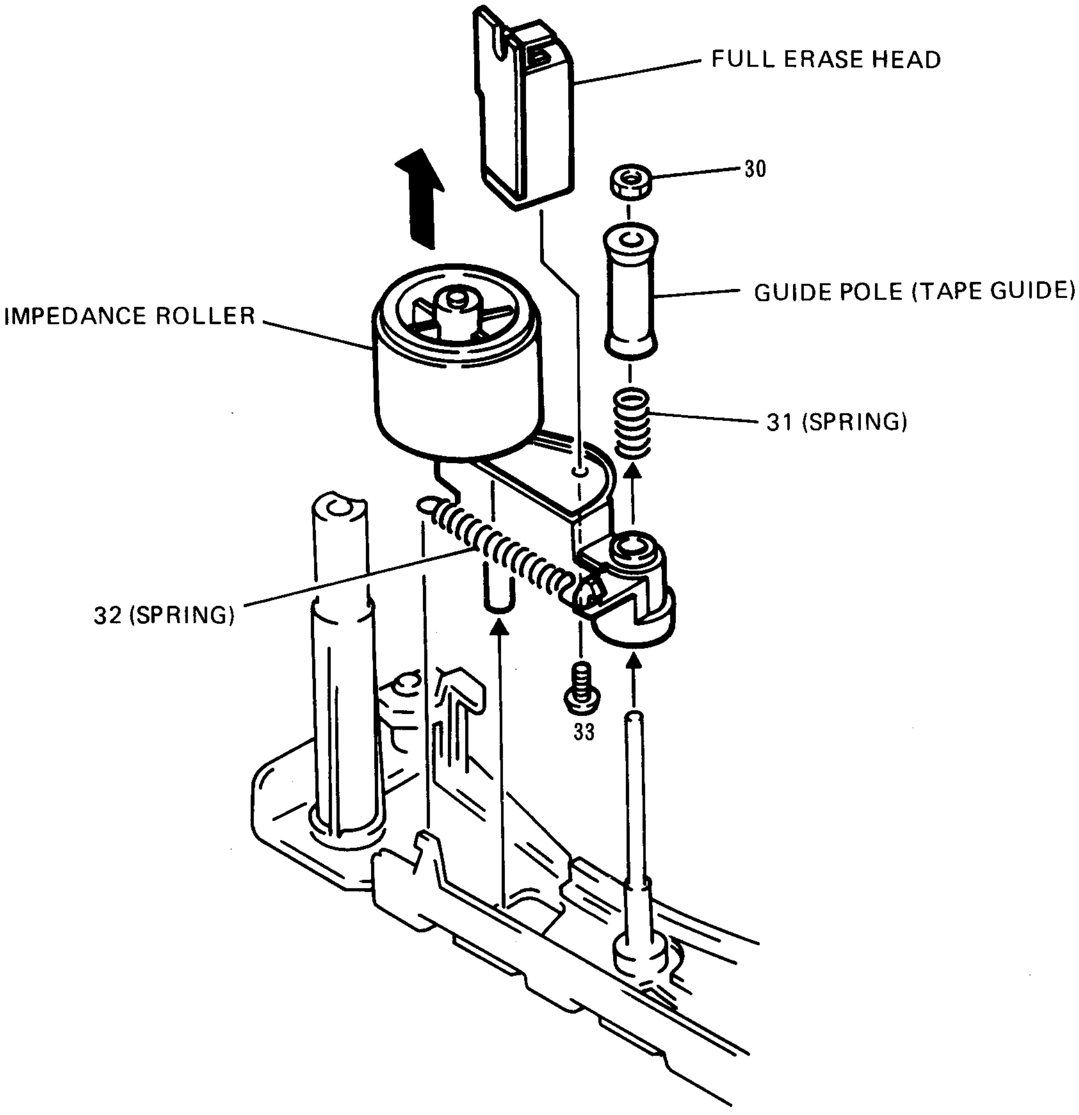

FULL ERASE HEAD
30
GUIDE POLE (TAPE GUIDE)
IMPEDANCE ROLLER
31 (SPRING)
32 (SPRING)
33

Fig. 36

6-15 AC (Audio/control) head (Fig. 37-1, Fig. 37-2)

① Remove the wiring guide.

② Remove the head base fixing nut (34) and washer to take out the AC head ass'y.

③ Tighten the head fixing screw (35) to the extent that it comes out approx. 1mm above the top of the AC head base, after replacing the AC head.

④ Tighten the head fixing screws (36, 37) until the head base and the AC head base are set paralle based on the height of the convex section of the head base.

⑤ Insert the spring (38) between the AC head ass'y and the chassis to hook it to the head base and chassis, to install the AC head to the chassis. Then, fix (38).

⑥ Perform the "AC head asjustment" described in the "Transport system adjustment. After the adjustment is completed, perform the electric adjustment (playback level and bias level).

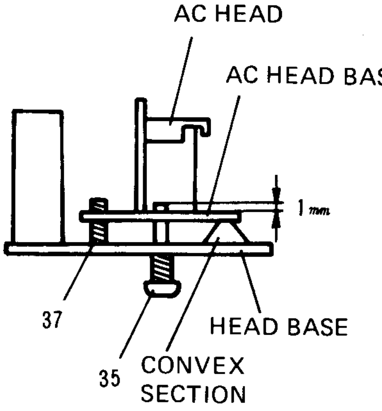

AC HEAD
AC HEAD BASE
1 mm
37
HEAD BASE
35
CONVEX SECTION

Fig. 37-2

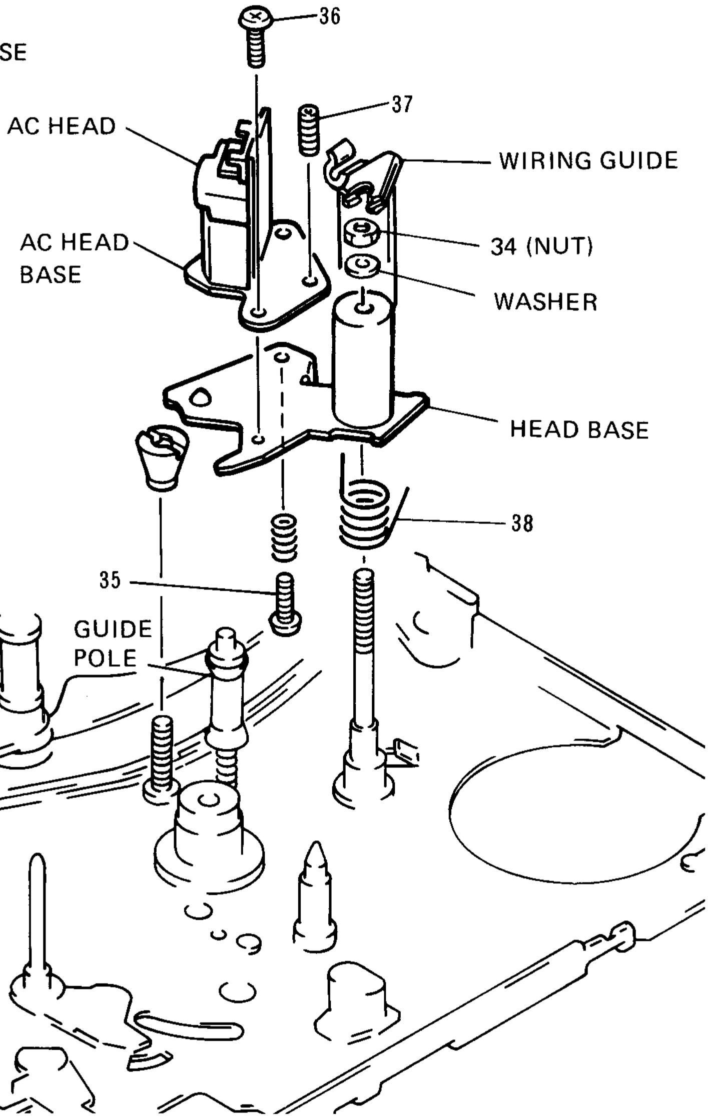

36
37
AC HEAD
WIRING GUIDE
AC HEAD BASE
34 (NUT)
WASHER
HEAD BASE
38
35
GUIDE POLE

Fig. 37-1

7. ELECTRIC CIRCUIT ADJUSTMENT

Test equipment, jigs and tapes required for overall circuit adjustment

1) Color TV set
2) Oscilloscope
3) VTVM
4) Color bar signal generator
5) Frequency counter
6) DC voltmeter
7) Alignment tape
8) Blank tape

Order of adjustment

Perform adjustment in the order shown below.

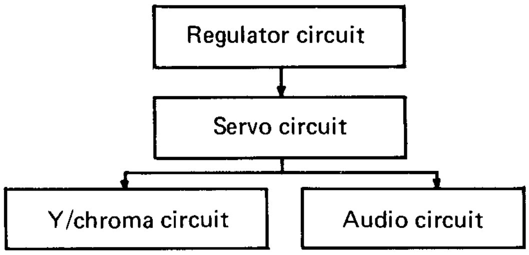
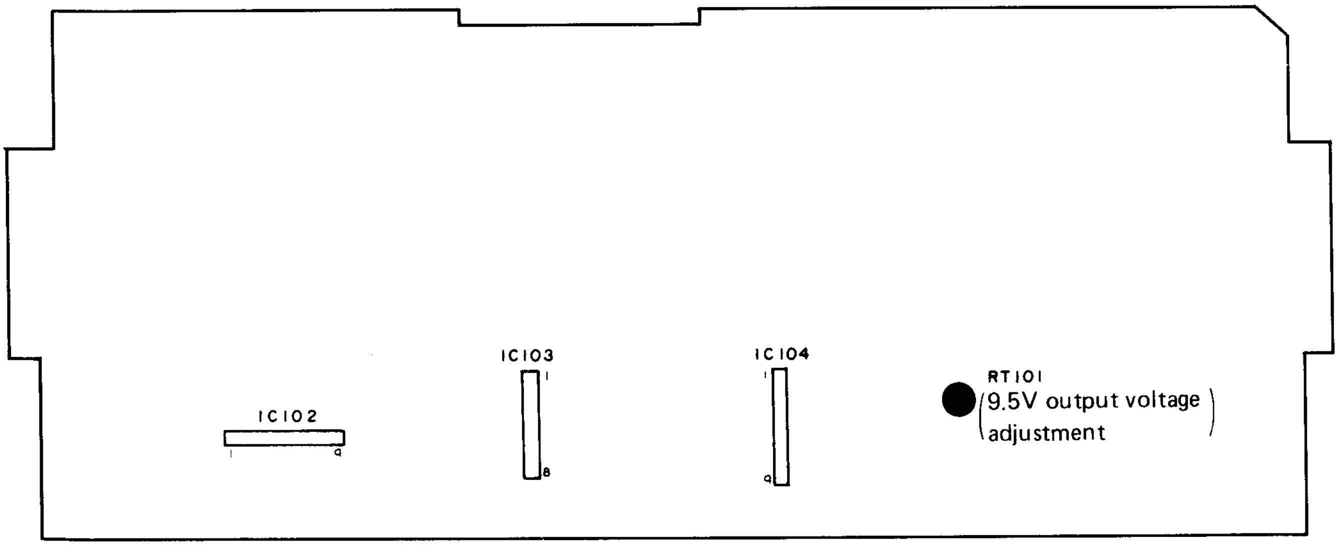

Regulator circuit
Servo circuit
Y/chroma circuit
Audio circuit

Fig. 41

7-1 Regulator circuit

Remove the top panel, set the VTR horizontal and follow the adjustment procedure shown below.


IC102
1
9
IC103
1
8
IC104
1
9
RT101
(9.5V output voltage adjustment)

Regulator PC Board (parts side)

1 9.5 V output voltage adjustment

Connecting test equipment

Connect a DC voltmeter to the test point terminal TP607 on the system control/servo PC Board.

State of VTR

EE mode

Position to be adjusted

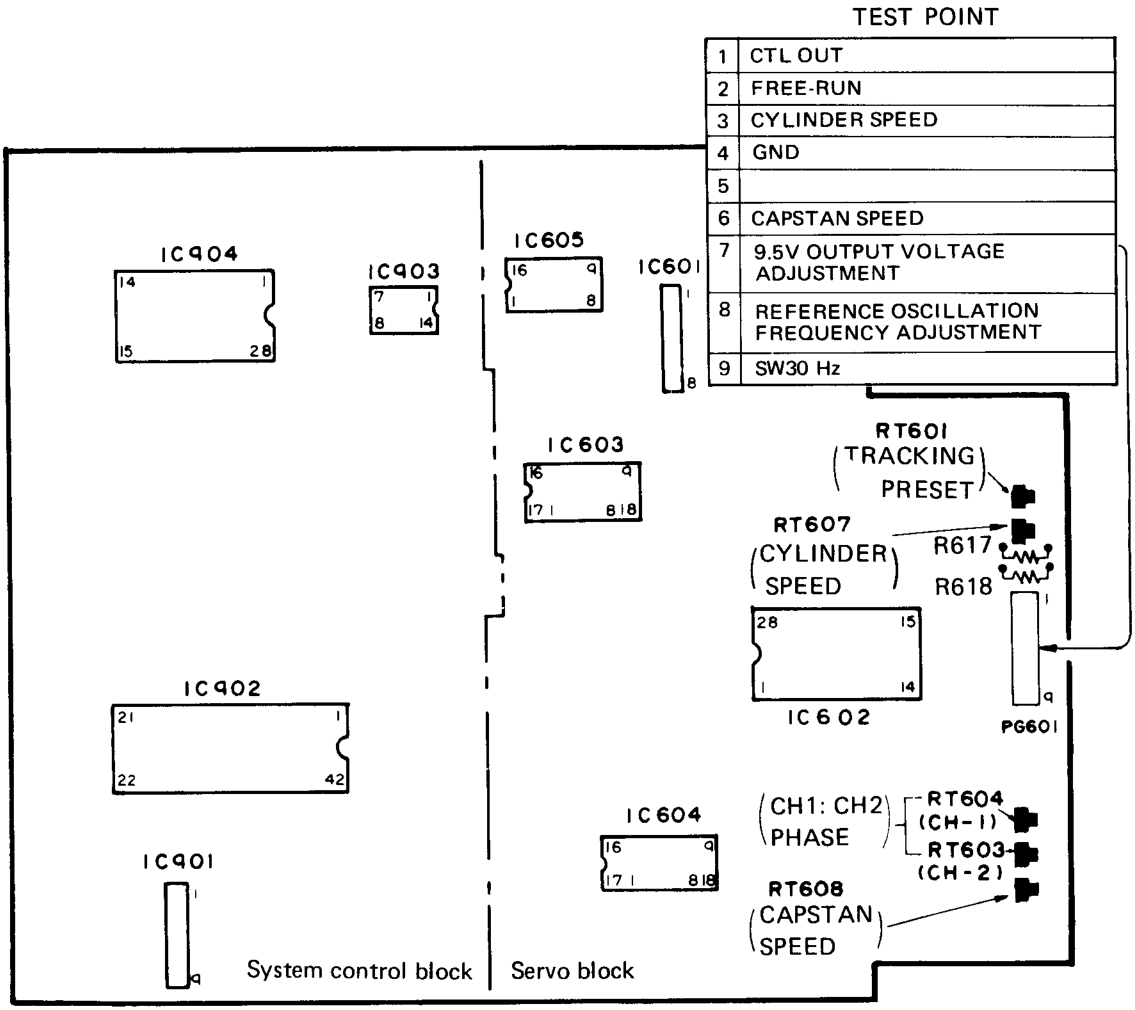
RT101

Adjustment procedure

Adjust RT101 so that the DC voltmeter indicates 9.5 V ± 0.1 V.

7-2 Servo circuit

Remove the top and front panels, set the VTR horizontal and then adjust using the procedure shown below. (The test point terminals and positions to be adjusted are installed on the front panel side.)



TEST POINT

1	CTL OUT
2	FREE-RUN
3	CYLINDER SPEED
4	GND
5	
6	CAPSTAN SPEED
7	9.5V OUTPUT VOLTAGE ADJUSTMENT
8	REFERENCE OSCILLATION FREQUENCY ADJUSTMENT
9	SW30 Hz

IC904
14
1
15
28
IC903
7
1
8
14
IC605
16
9
1
8
IC601
1
8
IC603
16
9
17 1
8 18
RT601
(TRACKING PRESET)
RT607
(CYLINDER SPEED)
R617
R618
28
15
1
14
IC602
PG601
1
9
IC902
21
1
22
42
IC604
16
9
17 1
8 18
(CH1: CH2 PHASE)
RT604 (CH-1)
RT603 (CH-2)
RT608
(CAPSTAN SPEED)
IC901
1
9
System control block
Servo block

System control/Servo PC Board (parts side)

1 **Cylinder speed adjustment**

This adjustment is to set the cylinder speed to 1800rpm constantly.

Connecting test equipment

1) Connect the color bar signal generator to the video input jack on the front panel, or receive a TV program.
2) Connect the oscilloscope between the test point terminals PG601-(3) and PG601-(4) (GND).

State of VTR

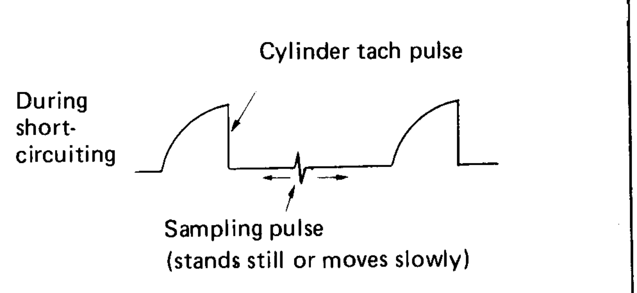
Set the record speed select switch to the STANDARD position and set the unit to the record mode. Tune the unit correctly when receiving a TV program to record it.

Position to be adjusted

RT607

Adjustment procedure

1) Short-circuit the test point terminals PG601-(2) and PG601-(7). Adjust RT607 so that the sampling pulse superimposed on the cylinder tach pulse shown in Fig. 42 moves slowly or stands still.



Cylinder tach pulse
During short-circuiting
Sampling pulse
(stands still or moves slowly)

Fig. 42

2) Disconnect the short-circuit between PG601-(2) and PG601-(7) (done in item 1). Check that the sampling pulse stands still at the trailing edge of the cylinder tach pulse shown in Fig. 43.

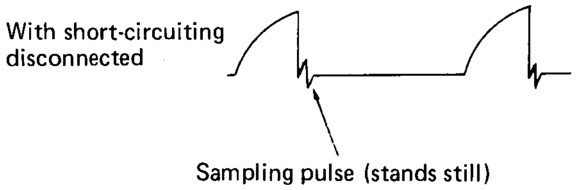

With short-circuiting disconnected
Sampling pulse (stands still)

Fig. 43

2 Capstan speed adjustment

This adjustment is to set the tape speed constantly to 33.4 mm/sec in the SP mode, 11.1 mm/sec in the EP mode, and to 16.7 mm/sec in the LP mode in which only playback is possible.

This unit does not require adjustment in modes other than the EP mode.

Connecting test equipment

1) Connect the color bar signal generator to the video input jack on the front panel, or receive a TV program.
2) Connect the oscilloscope between the test point terminals PG601-⑥ and PG601-④ (GND).

State of VTR

Set the tracking VR to the "click" point and the record speed select switch to EP and set the unit to the rocord mode. Tune the unit correctly when receiving a TV program to record it.

Position to be adjusted

RT608

Adjustment procedure

1) Short-circuit the test point terminals PG601-② and PG601-⑦ Adjust RT608 so that the sampling pulse superimposed on the tracking MM charge curve moves slowly or stands still.

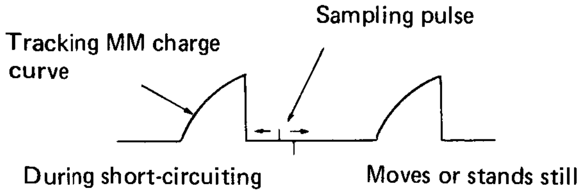

Sampling pulse
Tracking MM charge curve
During short-circuiting
Moves or stands still

Fig. 44

2) Disconnect short-circuit between PG601-② and PG601-⑦ (done in item 1). Check that the tracking pulse stands still around the leading edge of the tracking MM charge curve shown in Fig. 45.

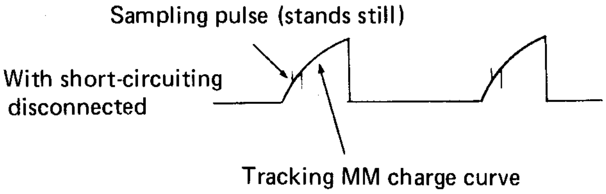

Sampling pulse (stands still)
With short-circuiting disconnected
Tracking MM charge curve

Fig. 45

Reference

The tape speeds in the LP and EP modes do not require adjustment. When it is desired to confirm these tape speeds, check that the sampling pulse shown in Fig. 45 stands still when the tape speed is set to LP or SP and the test point terminals PG601-② and PG601-⑦ are short-circuited while recording.

3 Reference oscillation frequency adjustment

Connecting test equipment

Connect the frequency counter to the audio output jack on the front panel.

State of VTR

Short-circuit the test point terminals PG601-⑧ and PG601-⑦ and set only the servo phase control system to the record mode. Then, play back the audio track 3 kHz section of the alignment tape.

Position to be adjusted

R618, R617

Adjustment procedure

Confirm that the reading of the frequency counter is 3000 Hz ± 15 Hz. Omit R618 when the reading is 3015 Hz or more. On the contrary, omit R617 when it is 2985 Hz or less.

4 CH1/CH2 phase adjustment

Connecting test equipment

1) Connect the "EXT TRIG" of the oscilloscope to the test point terminal TP609 (SW30 signal output) and PG601-(4) (GND), and the "INPUT" of the oscilloscope to the video output jack on the front of the VTR.
2) Connect the monitor TV to the VHF output terminal on the rear panel.

State of VTR

Play back the alignment tape.

Position to be adjusted

RT604 (CH1), RT603(CH2)

Adjustment procedure

1) Set the sync slope select switch of the oscilloscope to "–" when adjusting the phase in CH1, and set to "+" when adjusting the phase in CH2. Then adjust RT604 and RT603 so that the switching points of respective channels are 6.5 H ± 0.5 H before the vertical sync signal in the video signal.
2) Set the recording speed select switch to the EP position, and record the TV program for several minutes. Then check that the picture is stable when the recorded material is played back in the visual search mode. When it is not, readjust the switching point within the range of ± 0.5H.

5 Tracking Preset adjustment

Connecting test equipment

1) Connect the color bar signal generator to the video output jack on the front panel, or receive a TV program.
2) Connect the oscilloscope to the test point terminal TP202 on the Y/chroma/audio PC Board.

State of VTR

Set the tracking VR to the click point and the recording speed select switch to SP, and perform recording for several minutes. Then play back this section for adjustment.

Position to be adjusted

RT601

Adjustment procedure

Adjust RT601 so that the output of the FM envelope is at max. Next, turn the tracking VR left and right centering on the click point to check that RT601 is adjusted to the max. output point.

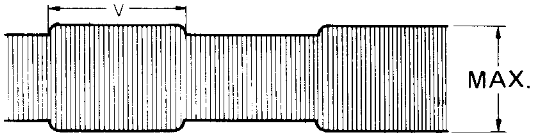


Fig. 47

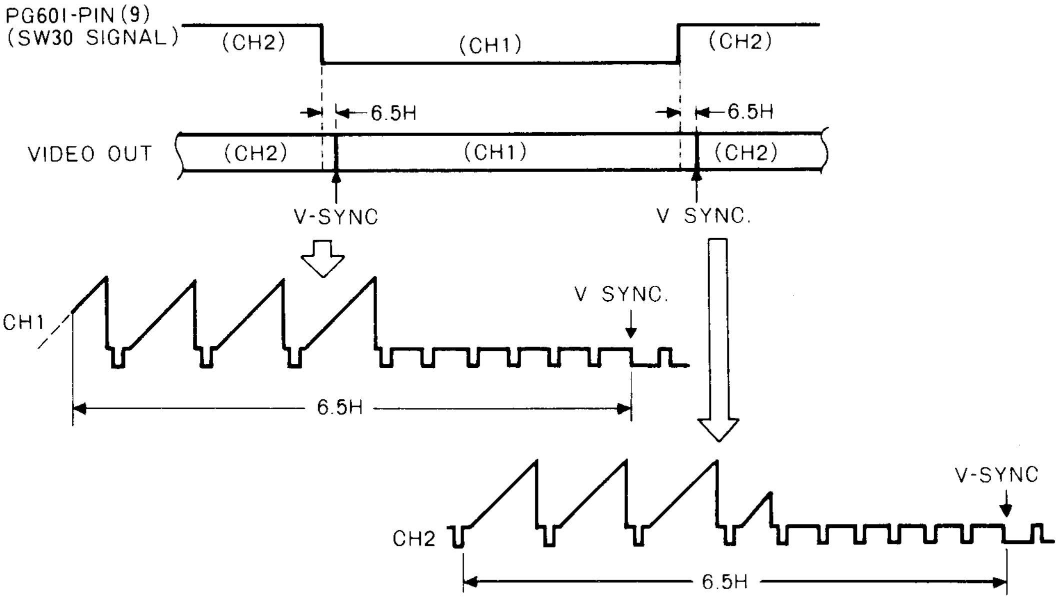
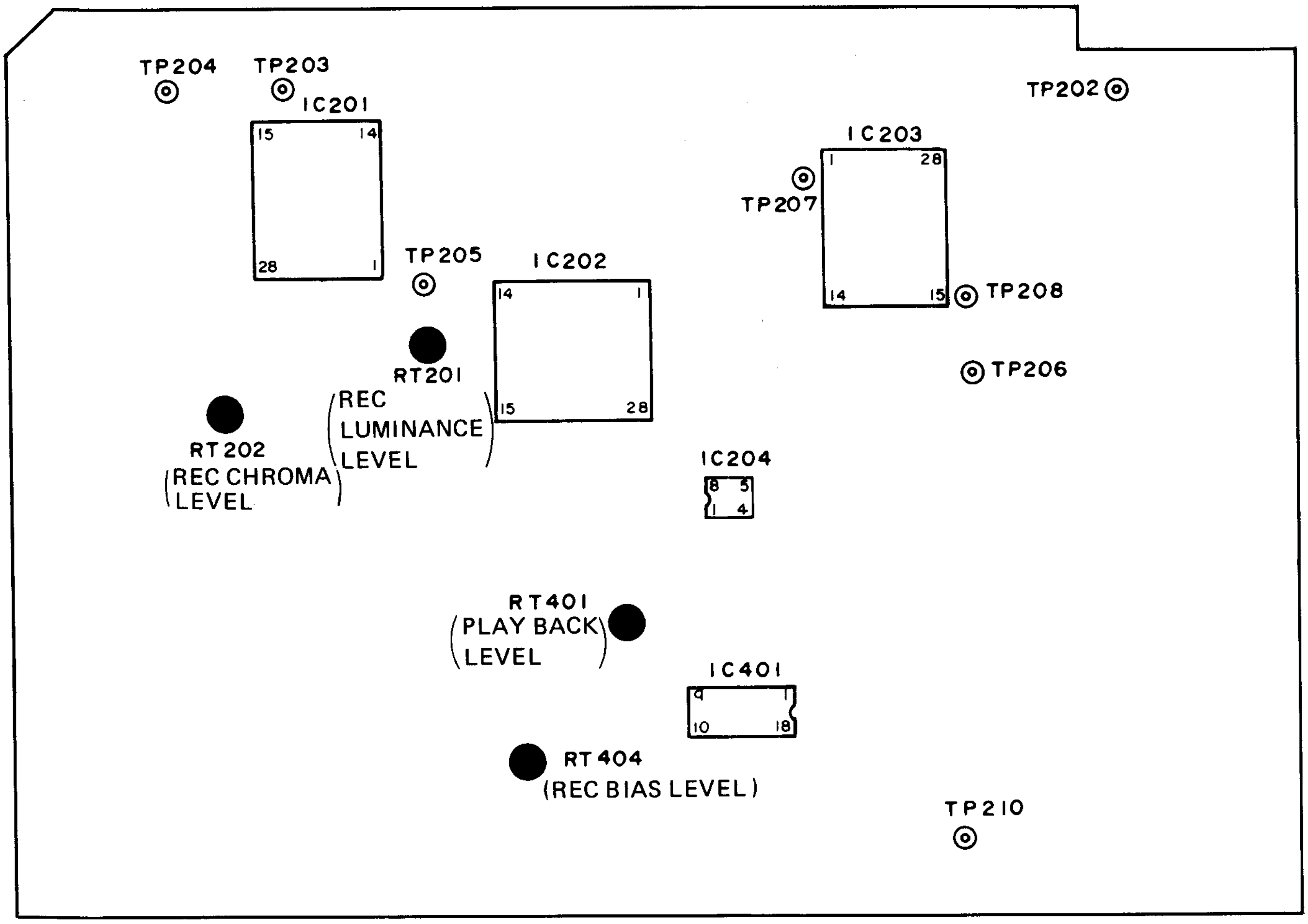


Fig. 46

7-3 Y/Chroma/Audio circuit

Remove the bottom cover, stand the VTR so that the side of the chassif faces doen and adjust using the following preocedure.


TP204
TP203
IC201
15
14
28
1
TP202
IC203
1
28
TP207
14
15
TP208
TP205
IC202
14
1
15
28
RT201
(REC LUMINANCE LEVEL)
RT202
(REC CHROMA LEVEL)
TP206
IC204
8
5
1
4
RT401
(PLAY BACK LEVEL)
IC401
9
1
10
18
RT404
(REC BIAS LEVEL)
TP210

Y/Chroma/Audio PC Board (Parts side)

1 Record Y/chroma level adjustment

The record Y/chroma level is set to the adjusted value shown in Table 1 according to the numerals marked on the upper cylinder shown in Fig. 48. When the cylinder or parts in the Y/chroma/audio circuit are replaced, check the cylinder mark before adjustment.

Record Y level

Cylinder mark	Level
No mark	130 mVp-p

Record chroma level

Cylinder mark	Level
No mark	35 mVp-p
1	40 mVp-p
2	40 mVp-p
3	40 mVp-p
4	45 mVp-p

Table 1

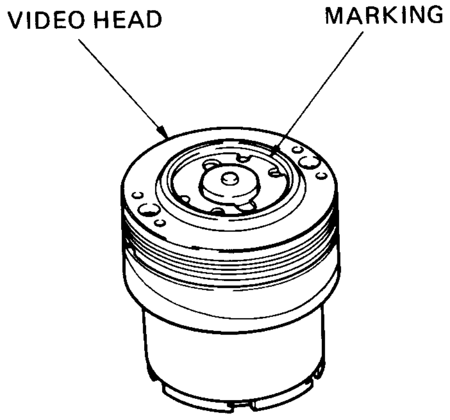

VIDEO HEAD
MARKING

Fig. 48

Connecting test equipment

1) Connect the color bar signal generator to the video input jack on the front panel or receive a TV program.
2) Connect the oscilloscope to the test point terminal TP204.

State of VTR

Set the recording speed select switch to EP and set the unit to the record mode.

Position to be adjusted

RT201 (Record luminance level)

RT202 (Record chroma level)

Adjustment procedure

Turn RT201 fully counterclockwise, and then adjust RT202 so that the reading of the oscilloscope corresponds to the marked value. Next, adjust RT201 so that the reading of the oscilloscope is 130 mVp-p.

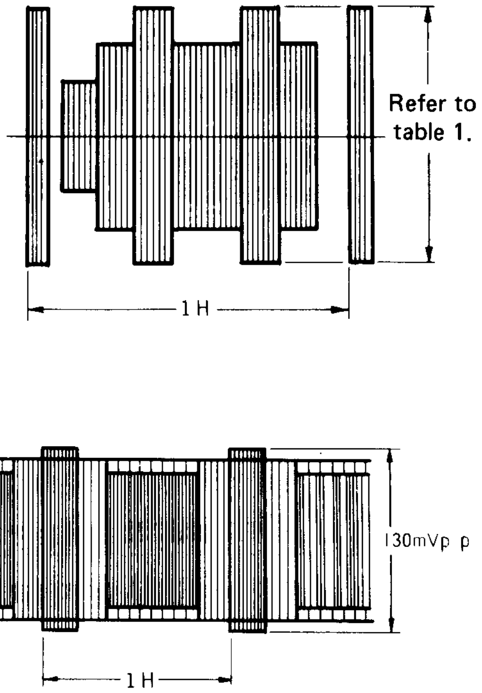


Fig. 49

2 Audio playback level adjustment

Connecting test equipment

Connect the VTVM to the audio output jack on the front panel.

State of VTR

Play back the 1 kHz audio track section of the alignment tape.

Position to be adjusted

RT401

Adjustment procedure

Adjust RT401 so that the reading of the VTVM is -4 dBm.

3. Audio bias level adjustment

Connecting test equipment

Connect the VTVM to both pins on the AC head PC Board shown in Fig. 50.

State of VTR

Set the recording speed select switch to SP to set the unit to the no-signal recording mode.

Position to be adjusted

RT404

Adjustment procedure

Adjust RT404 so that the reading of the VTVM is 3.2 mV.

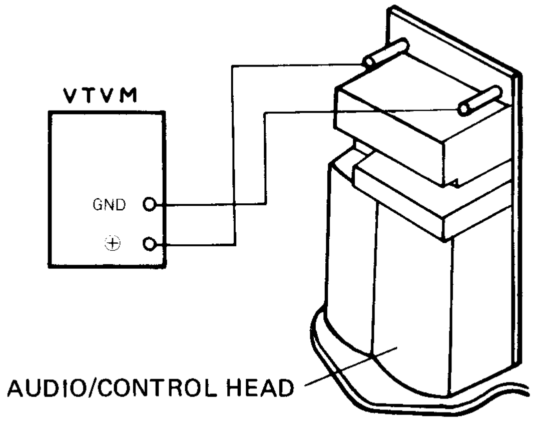
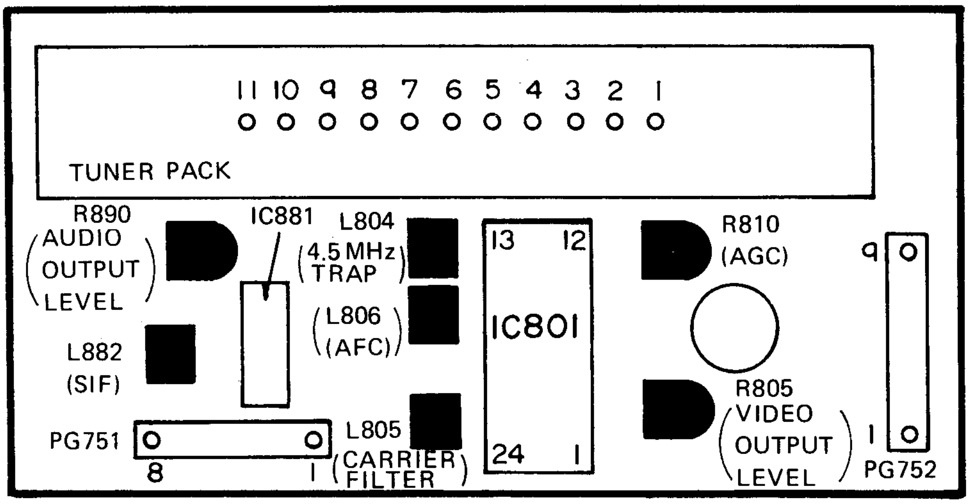


Fig. 50

7-4 Tuner/IF Circuit

Note: In the unit, the tuner pack and IF is a single unit. It has been adjusted carefully, but if it gets out of adjustment, adjust it by the following procedure.
When it is desired to adjust the tuner pack and IF remove this block from the unit.


11 10 9 8 7 6 5 4 3 2 1
TUNER PACK
R890
(AUDIO OUTPUT LEVEL)
IC881
L804
(4.5MHz TRAP)
L806
(AFC)
13 12
IC801
24 1
R810
(AGC)
9
R805
(VIDEO OUTPUT LEVEL)
L882
(SIF)
PG751
8
1
L805
(CARRIER FILTER)
1
PG752

IF P.C.B (Parts side)

1. Carrier filter adjustment

Connection

1) Connect the sweep marker generator (Output: –30 ± 10 dBm, marker frequency: 45.75 MHz) to IC801 pin ⑥ of the IF pack via the coupling circuit shown in Fig. 51.
2) Supply +8.9V DC to IC801 pin ⑫, +12V DC to PG751-PIN 5.
3) Connect the oscilloscope to PG751-pin ② and observe the IF signal waveform.

Mode

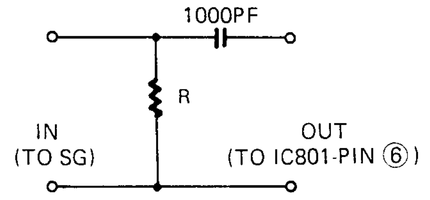
EE mode.

Adjustment Point

L805

Adjustment

Adjust the core of L805 so that the 45.75 MHz ± 50 kHz component of the waveform of video output is maximum. (See Fig. 52)


1000PF
R
IN
(TO SG)
OUT
(TO IC801-PIN ⑥)

R:
SELECT A VALUE TO MATCH OUTPUT IMPEDANCE OF SIGNAL GENERATOR.

Fig. 51

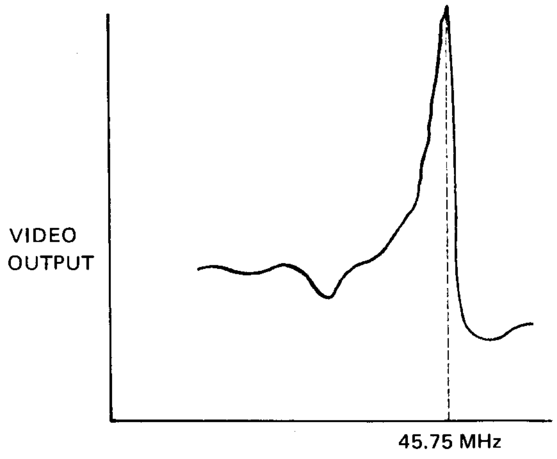


Fig. 52

2. 4.5 MHz trap adjustment

Connection

1) Connect the sweep marker generator to IC801 pin 6 of the IF pack via the coupling circuit shown in Fig. 51
   (−20 ± 10 dBm, marker frequency: 41.25 MHz, 47.25 MHz)
2) Connect the oscilloscope to PG751-pin 2, +12V DC to PG751-PIN 5.
3) Supply +8.9 V DC to IC801 pin 12 .

Mode

EE mode

Adjustment point

L804

Adjustment

Adjust the core of L804 so that the level of audio trap frequency (41.25 MHz) is minimum. (See Fig. 53).

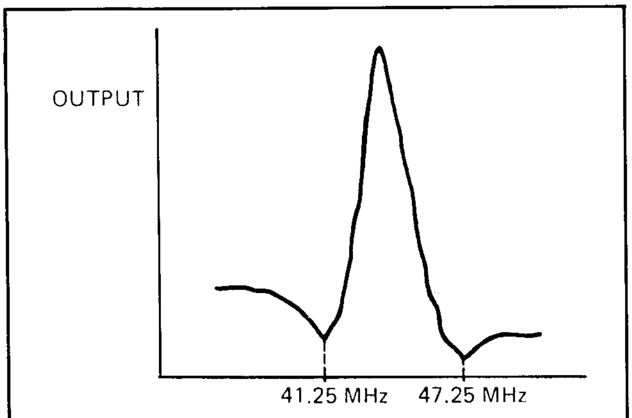


Fig. 53

3. AFC adjustment

Connection

1) Connect the sweep marker generator (Output: −4 ± 5 dBm, marker frequency: 45.75 MHz) to tuner pack-pin 9 via the coupling circuit shown in Fig. 51.
2) Supply +9.1V DC to IC801 pin 12 +12V DC to PG751-PIN 5.
3) Connect the oscilloscope to PG752-pin 1 via the coupling circuit shown in Fig. 54.

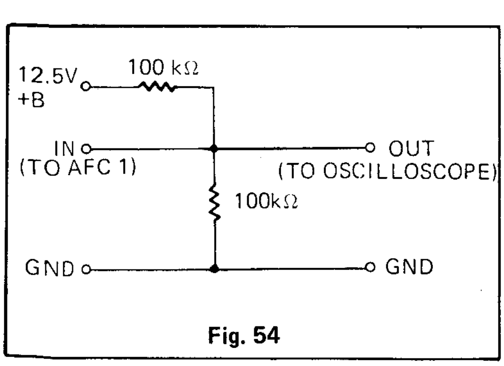


Fig. 54

Mode

EE mode

Adjustment Point

L806

Adjustment

Adjust L806 so that the output voltage at 45.75 MHz is 6.5 V ± 1.0 V. (See Fig. 55)

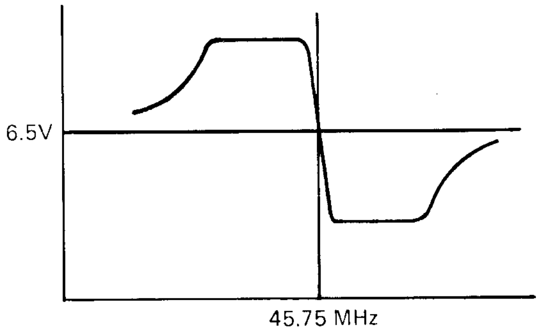


Fig. 55

4. SIF adjustment

Connection

1) Connect the AM signal generator (41.25 MHz ± 5 kHz, −60 ± 5 dBm, Audio signal (400 Hz): AM 30% modulation) to IC801 pin 2 of IF pack via the coupling circuit shown in Fig. 51
2) Connect the oscilloscope to PG751-pin 4 and observe the audio IF signal waveform.
3) Supply +8.9V DC to IC801 pin 12 +12V DC to PG751-PIN 5.

Mode

EE mode

Adjustment Point

L882

Adjustment

Adjust L882 so that the output is minimum.

5. Video output adjustment

Connection

Connect the color bar RF generator to the ANTENNA INPUT terminal of VTR.

(VHF input: channel 13, –41 ± 10 dBm, modulation degree 87.5%)

Mode

EE mode

Adjustment Point

R805

Adjustment

1) Press the channel selector switch 13 and tune the VTR for best reception by observing the picture on the screen.
2) Close the channel preset cover. (AFC switch: ON)
3) Connect the oscilloscope to PG751-pin 2 and adjust R805 so that the output level is 1 Vp-p. (See Fig. 56)

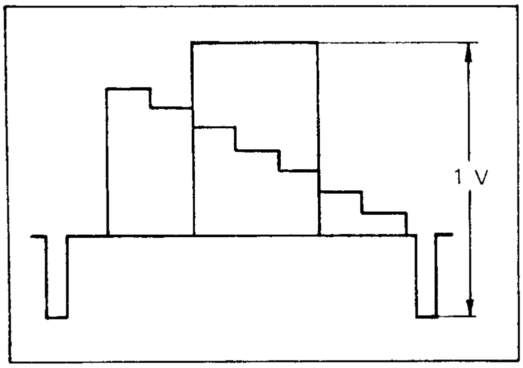


Fig. 57

6. Audio output level adjustment

Connection

Connect the TV signal generator to the ANTENNA INPUT terminal of VTR

(VHF input: channel 13, -41 ± 10 dBm, 30% modulation with sinewave audio signal at 400 Hz)

Mode

1) EE mode
2) AFS switch ON

Adjustment

1) Press the channel selector switch 13 and tune the VTR for best reception by observing the picture on the screen.
2) Close the channel presset cover (AFC switch: ON)
3) Connect the oscilloscope to PG751-pin 4
4) Adjust R890 so that the output level is equal -15 ± 1.5 dBm.

7. AGC adjustment

Connection

Connect the color bar-RF-generator to the ANTENNA INPUT terminal of VTR.

(VHF input: channel 13, –44 dBm, modulation degree 87.5%)

Mode

Turn power ON.

Adjustment Point

R810

Adjustment

1) Press the channel selector switch to channel 13, and tune the VTR for best reception by observing the picture on the screen.
2) Close the channel preset cover. (AFC switch: ON)
3) Measure the voltage at the AGC terminal of tuner pack-pin ④ and adjust R810 so that the voltage is 9.2 V ± 0.1 V.

8 MECHANISM ADJUSTMENT

8-1 Adjusting mechanism state switch installation position

The mechanism state switch is installed at the position near the supply reel at the bottom of the chassis. Adjust the installation position of the mechanism state switch according to the procedure shown below when the mechanism state switch is replaced.

(1) Turn the pulley installed to the shaft of the worm gear in the loading mechanism shown in Fig. 60 by hand in the unloading direction (counterclockwise A) until it stops.

(2) Match the top of the triangular hole in the knob of the mechanism state sensor switch shown in Fig. 60 with the top of the triangle of the "STOP" position engraved on the body of the mechanism state switch.

(3) Tighten the mechanism state switch fixing screw Ⓐ and then load a blank tape and set the Stop ↔ F.FWD/Rewind ↔ REC/PLAY ↔ REC-PAUSE ↔ PLAY → Reverse visual search modes, to check that the mechanism operates normally. When the operation in any mode is faulty, readjust the mechanism state switch installation position.

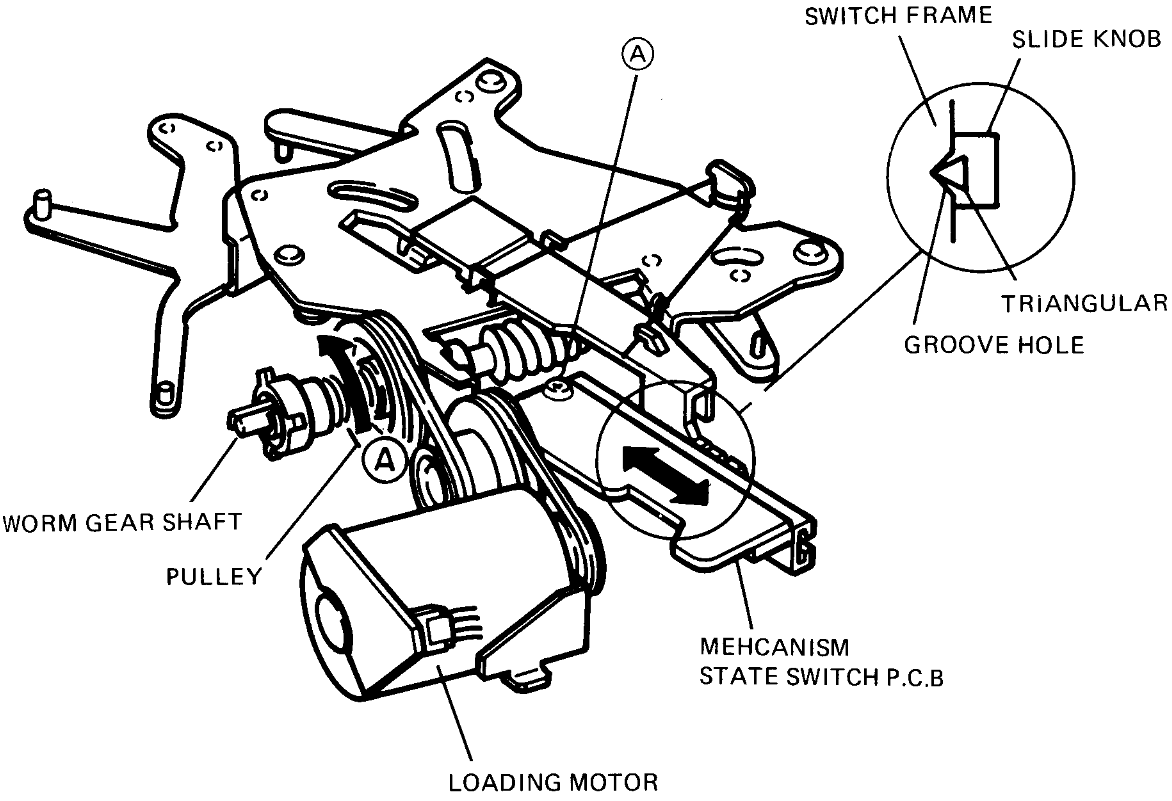

SWITCH FRAME
SLIDE KNOB
Ⓐ
TRIANGULAR
GROOVE HOLE
Ⓐ
WORM GEAR SHAFT
PULLEY
MEHCANISM
STATE SWITCH P.C.B
LOADING MOTOR

Fig. 60

8-2. Transport system adjustment

The adjustment items shown below are related to the tape transport system.

(1) Reel disk height adjustment
(2) Tension pole adjustment
(3) Guide pole height adjustment
(4) AC head height/azimuth/tilt adjustment
(5) Guide roller height adjustment

With the tape transport system, it is basically most important that the route from the supply reel disk to the take-up reel disk shown in Fig. 61 is clean without creases and is stable. The tape transport system is adjusted precisely in the factory while paying utmost attention. When parts related to the tape transport system are replaced, the tape transport should be kept stable by adjusting only the replaced parts. When the adjustment of the parts is not done or parts other than those replaced are moved, the adjustment of the parts concerning the tape transport system may get out of order and result in unsatisfactory operation.

Do not loosen the fixing screws for the parts shown below. When parts are to be replaced due to breakage, etc., be sure to install the new parts to the same positions where the replaced parts were installed before, and then perform the precise adjustment described in the item "Guide roller height adjustment".

(1) Catcher on the supply or take-up side.
(2) inclined guide on the supply or take-up side.

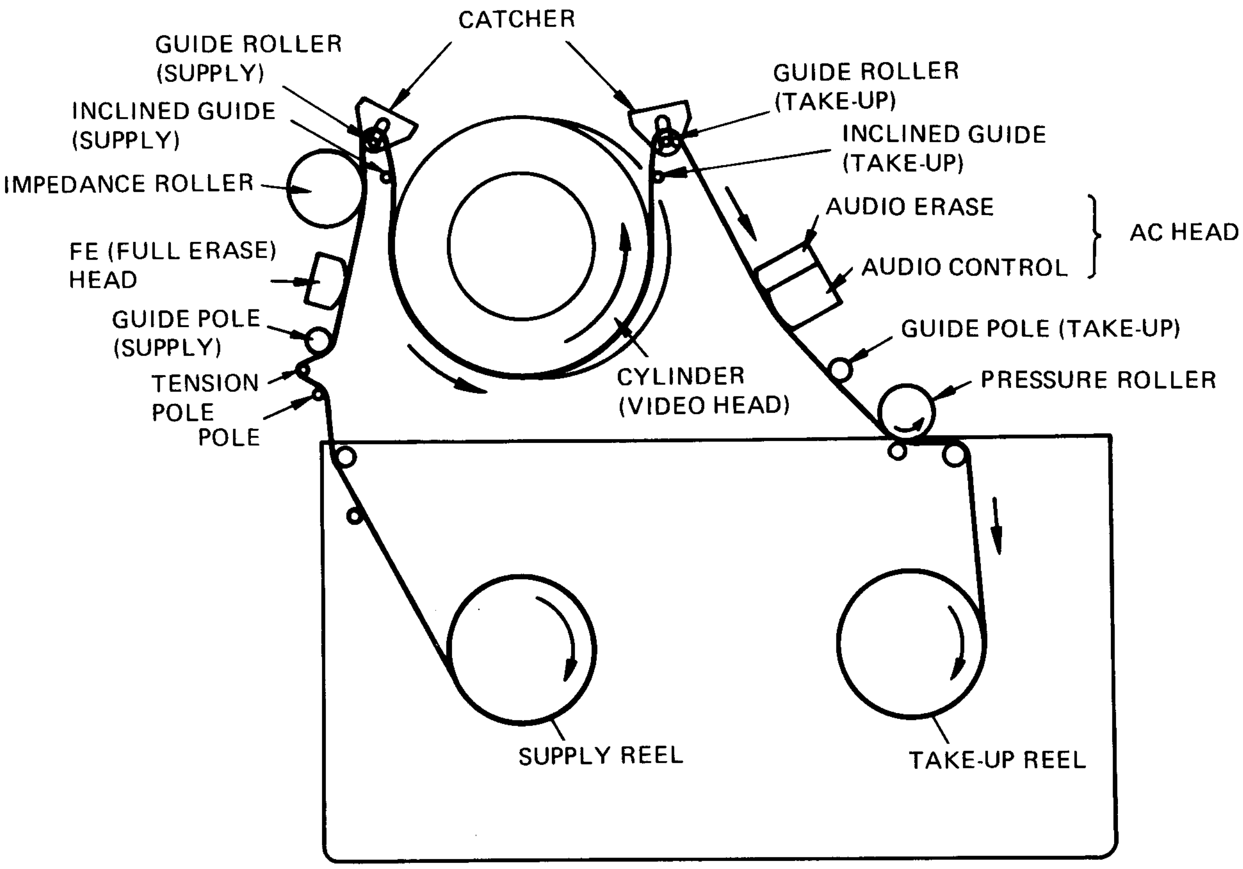

CATCHER
GUIDE ROLLER (SUPPLY)
INCLINED GUIDE (SUPPLY)
IMPEDANCE ROLLER
FE (FULL ERASE) HEAD
GUIDE POLE (SUPPLY)
TENSION POLE
POLE
GUIDE ROLLER (TAKE-UP)
INCLINED GUIDE (TAKE-UP)
AUDIO ERASE
AUDIO CONTROL
AC HEAD
GUIDE POLE (TAKE-UP)
PRESSURE ROLLER
CYLINDER (VIDEO HEAD)
SUPPLY REEL
TAKE-UP REEL

Fig. 61

(1) Reel disk height adjustment (Fig. 62))

Jigs required for adjustment

Master plane, reel height adjusting jig

Adjustment procedure

1) Remove the top panel and cassette holder.
2) Mount the master plane, place the reel height adjusting jig on the master plane as shown in Fig. 62, and check whether or not the reel disk enters between side A and side B of the reel height adjusting jig. When the reel disk does not enter between side A and side B, adjust the quantity of spacers (2 types: 0.25 mm and 0.5 mm) inserted between the reel disk and the base of the reel disk.

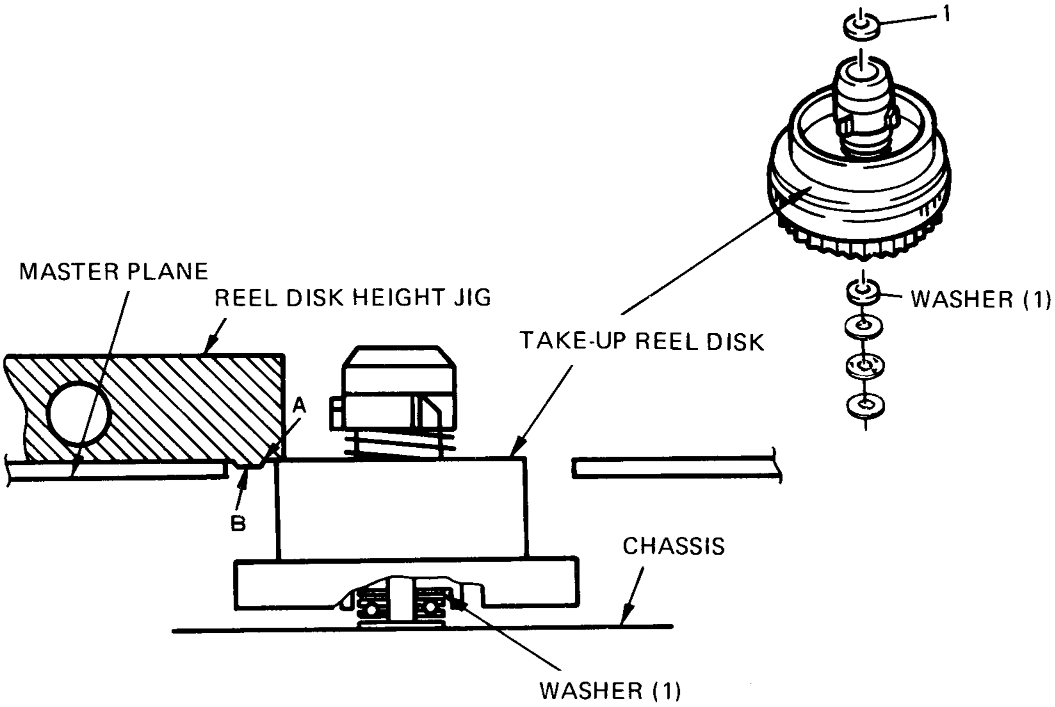

1
MASTER PLANE
REEL DISK HEIGHT JIG
TAKE-UP REEL DISK
WASHER (1)
A
B
CHASSIS
WASHER (1)

Fig. 62

(2) Tension pole adjustment (Fig. 63)

Jig required for adjustment

Back tension meter

Adjustment procedure

Perform this adjustment after removing the cassette panel to set the VTR horizontal.

1) Remove the cassette panel.
   Note: Remove the top panel, cassette holder and tension band when replacing the tension arm.
2) Shut off the supply end sensor (no light can be received), and set the VTR to the play mode without loading a tape. Check that the gap between the tension pole and chassis shown in Fig. 63 is 1.5 mm ± 0.5 mm at that time. When it is not, loosen the tension band fixing screw, insert the tip of a (–) screwdriver into the groove in the loading motor holder and the groove in the tension band bracket shown in Fig. 63, to move the tension band bracket by turning the screwdriver. Tighten the tension band fixing screw and apply locking paint after adjustment is completed.
3) Mount the back tension meter and set the VTR to the play mode. Check that the reading of the back tension meter is 35 ± 8 g · cm at that time. If not, loosen the spring hanger fixing screw shown in Fig. 63, insert the tip of the (–) screwdriver into the groove in the chassis and the groove in the spring hanger, and move the tension hanger installation position while turning the screwdriver to adjust that the back tension is 35 ± 2 g · cm.
   Tighten the tension hanger fixing screw and apply locking paint after adjustment is completed.
   Note: The back tension values are different between during confirmation and adjustment.

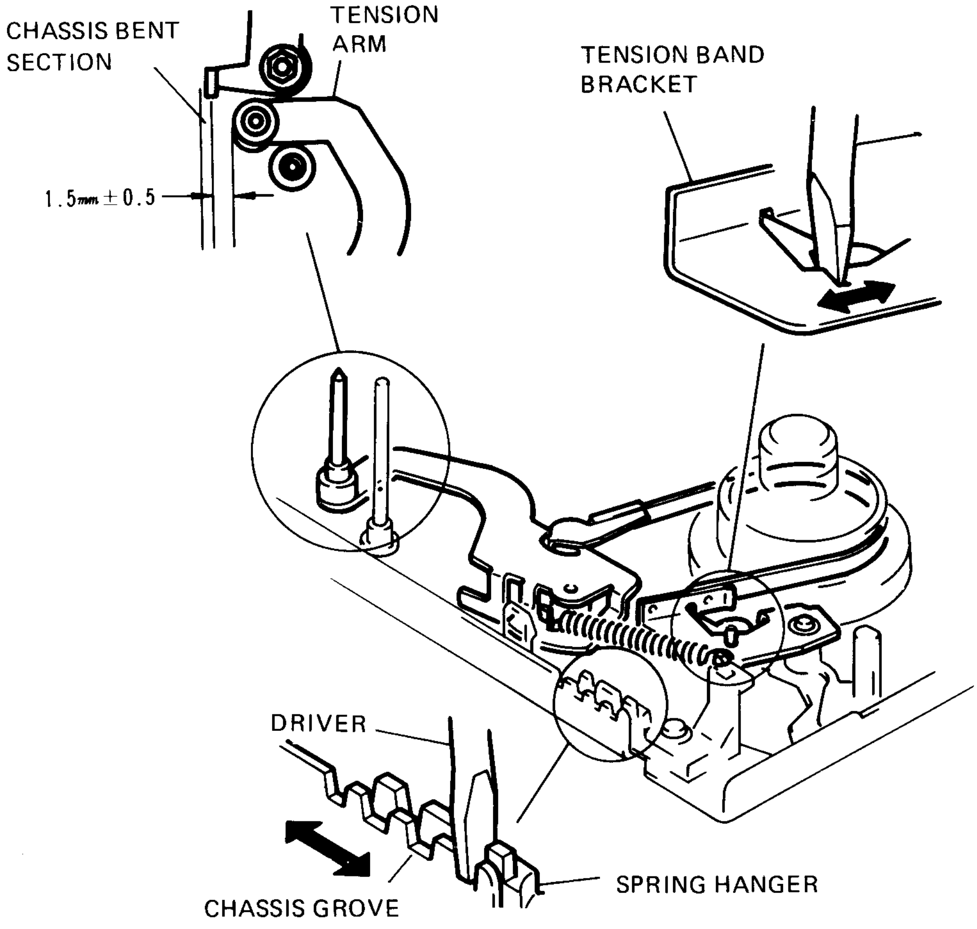


Fig. 63

(3) Guide pole height adjustment (Fig. 64)

Jigs required for adjustment

Master plane, reel height adjusting jig, blank tape

Adjustment procedure

Guide pole height adjustment: Perform rough adjustment using the master plane and reel height adjusting jig first, and then run a blank tape to adjust the height precisely.

1) Remove the top panel and cassette holder.
2) Mount the master plane and place the reel height adjusting jig on the master plane shown in Fig. 64. Then, roughly adjust the guide pole height adjusting nut so that the gap between the flange of the guide pole and the reel height adjusting jig is within 0 - 0.2 mm when side C of the jig is applied to the guide pole.
3) Install the cassette holder, load a blank tape and play it back. Check that the tape does not ride over the flange of the guide pole and runs stably at that time.

   When it does not, fine-adjust the guide pole height.
4) Tighten the adjusting nut and apply locking paint after adjustment is completed.

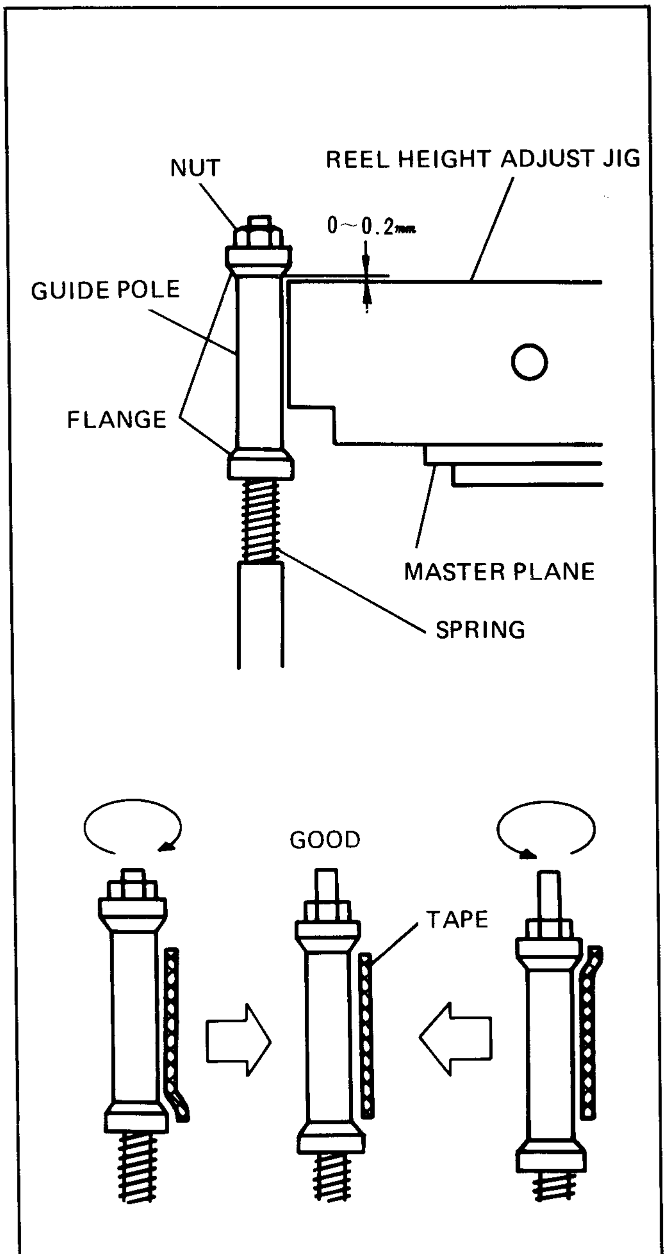


Fig. 64

(4) AC head adjustment (Fig. 65)

The AC head adjustment consists of the audio play output/recording bias level adjustment described in the "Circuit adjustment" as well as the height/azimuth/tilt adjustment described in the following. Perform all these adjustments when the AC head is replaced. The adjustment details below show the adjustment procedure when the AC head is replaced; be sure to perform precise adjustment after rough adjustment.

AC head rough-adjustment

Jigs required for adjustment

Master plane, reel height adjusting jig, blank tape

Adjustment procedure

1) Tighten the screw shown in Fig. 65 through the bottom of the head base (2) via the spring so that it projects approx. 1 mm above the top of the AC head base (1).
2) Roughly adjust the tilt adjusting screw shown in Fig. 65 and azimuth adjusting screw so that the gap between the AC head base (1) and head base (2) is approx. 2.3 mm, and the AC head base (1) and head base (2) are parallel.
3) Remove the cassette holder and mount the master plane.
4) Place the reel height adjusting jig on the master plane as shown in Fig. 66. Then roughly adjust the AC head height adjusting nut so that the gap between the reel height adjusting jig and the shield case of the AC head is approx. 0.5 mm when the side C of jig is applied to the AC head.
5) Install the cassette holder, load a blank tape and set the VTR to the play mode. Check that there is no conspicuous curling or protruding around the AC head at that time. The ideal AC head height is with the bottom of the tape approx. shown fig. 67, 0.3 mm from the bottom of the core of the CTL head. Roughly adjust the tilt adjusting screw, azimuth adjusting screw and AC head height adjusting nut when conspicuous curling or protruding occurs.
6) Perform precise adjustment

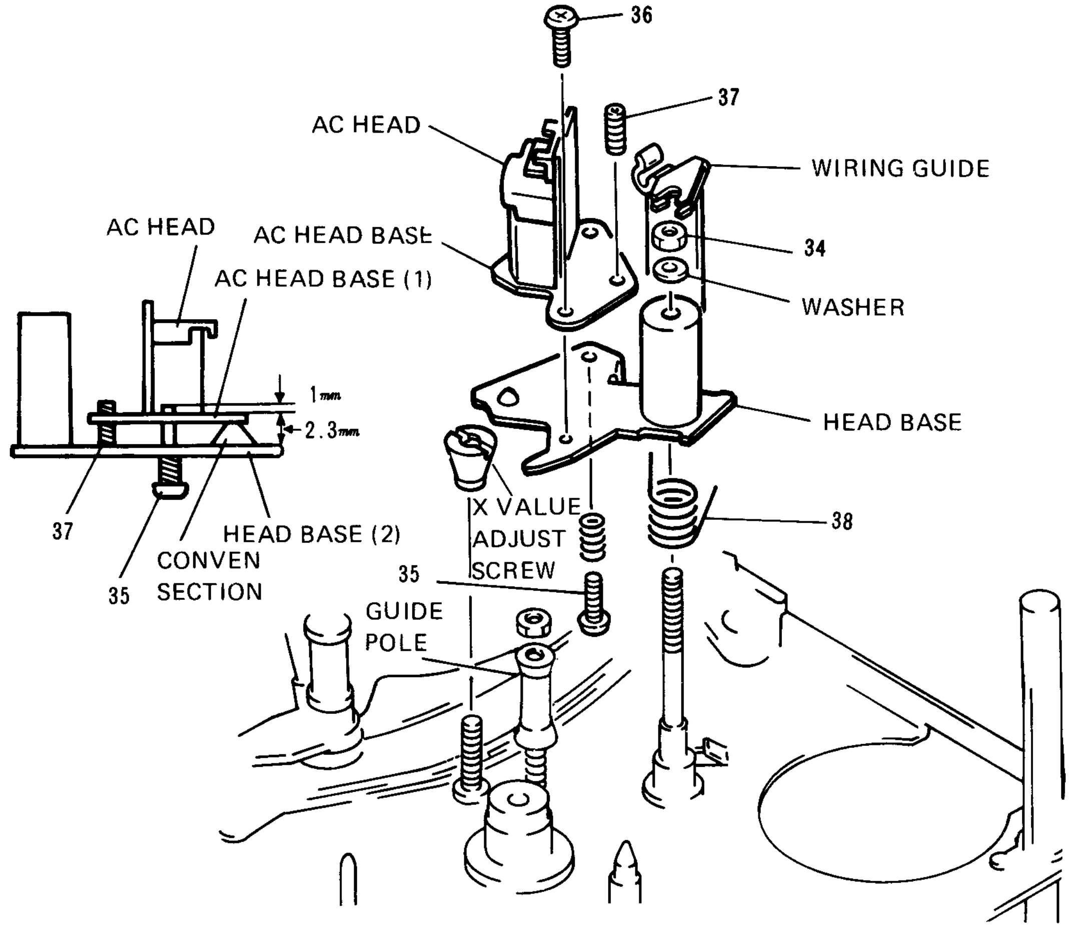


Fig. 65

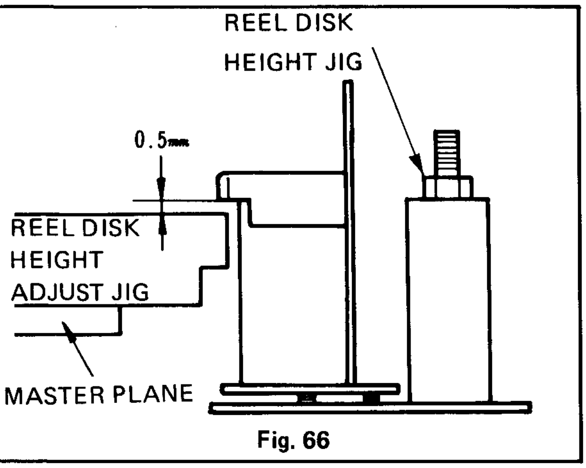

REEL DISK
HEIGHT JIG
0.5mm
REEL DISK
HEIGHT
ADJUST JIG
MASTER PLANE

Fig. 66

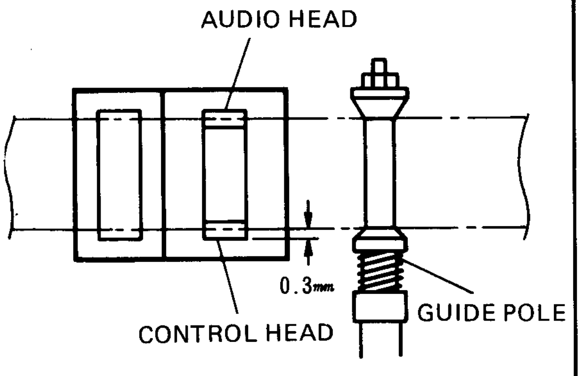

AUDIO HEAD
0.3mm
CONTROL HEAD
GUIDE POLE

Fig. 67

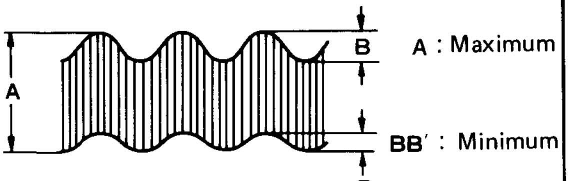

A
B
A : Maximum
BB' : Minimum
B

Fig. 68

AC head precise adjustment

Jig required for adjustment

Alignment tape

Adjustment procedure

1) Connect an oscilloscope to the "AUDIO OUT" jack at the front of the VTR.
2) Play back the audio 7 kHz section of the alignment tape. Adjust the tilt adjusting screw, azimuth adjusting screw and AC head height adjusting nut alternately so that the audio output is max., the envelope is flat and stable as shown in Fig. 68.
3) Remove the bottom cover and connect the oscilloscope to the FM output pin (TP202) of the Y. chroma/Audio PC Board.
4) Check that the FM output is max. at the click position and the FM output level starts falling at the same angle on the left and right from the click position when the tracking VR on the front of the VTR is turned left and right from the position while playing back the alignment tape. When the FM output level does not start falling at the same angle on the left and right, set the tracking VR to the click position and adjust the X value adjusting screw shown in Fig. 69. (When the tracking VR is turned clockwise and the FM signal output starts falling earlier than when turned counterclockwise, turn the X value adjusting screw clockwise.)
5) Check item 4 again.
6) Apply locking paint to the tilt adjusting screw, azimuth adjusting screw, AC head height adjusting nut and X value adjusting screws.
7) Adjust the play output and recording bias level as described in "Circuit adjustment".

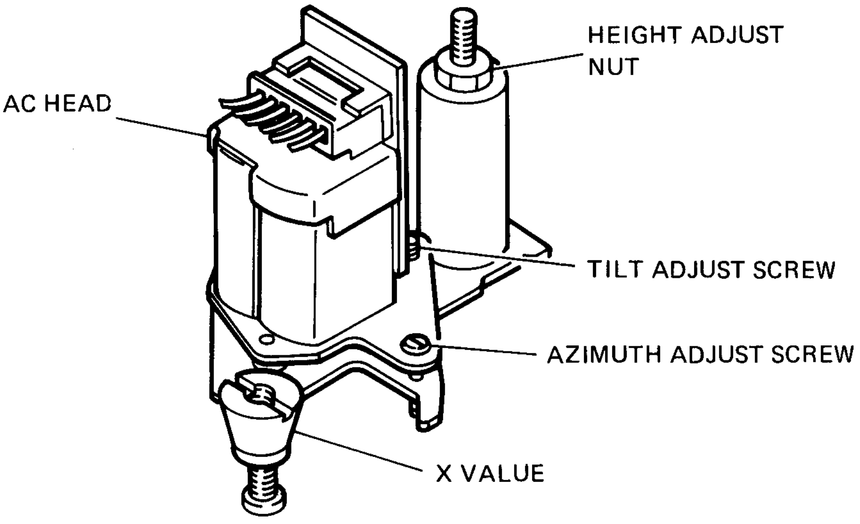

HEIGHT ADJUST
NUT
AC HEAD
TILT ADJUST SCREW
AZIMUTH ADJUST SCREW
X VALUE

Fig. 69

(5) Guide roller height adjustment

Jig required for adjustment

Alignment tape

adjustment procedure

1) Remove the top panel and shield cover, and play back a blank tape. Check that conspicuous curling, protruding or lifting does not occur around the tape guide of the lower cylinder at that time. When any curling, protruding or lifting occurs, set the VTR to the stop mode after checking the back tension, and then loosen the guide roller fixing screw shown in Fig. 70 to set the VTR to the play mode again, and roughly adjust the guide roller height.
2) Connect the oscilloscope to the FM output terminal TP202.
3) Play back the alignment tape and adjust the tracking VR at the front of the VTR so that the FM signal output is max Turn the tracking VR in either direction so that the FM signal output is 75% of the max. value, after adjustment is completed.
4) Check the FM signal envelope; conspicuous fluctuations should not be present and the ratio between the max. section and min. section (this is called "flatness"), 60% or more. When the FM signal waveform is as shown in Fig. 71 and below the specifications shown above, adjust the supply guide roller. On the other hand when the waveform is as shown in Fig. 72 and over the specifications shown above, adjust the take-up guide roller.

   Do not turn the guide roller more than 1 turn, at that time.
5) Load a blank tape, and record the color bar signal or a TV program for 2 - 3 minutes in the "SP" speed mode.
6) Play back the section recorded in item 5). Check that the FM signal envelope is within the specifications described in item 4).
7) Tighten the guide roller fixing screw after adjustment is completed.

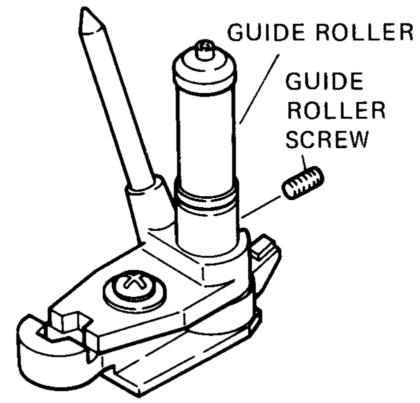
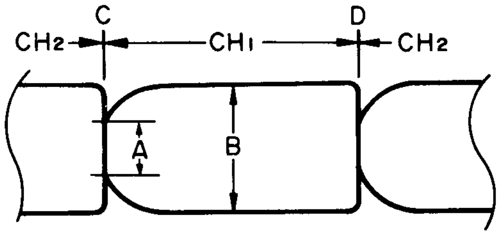
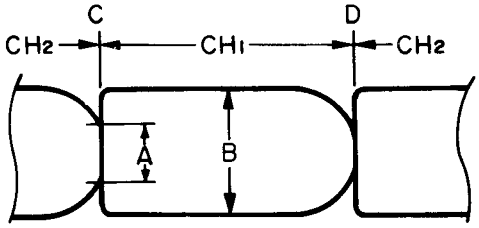


Fig. 70



$A \geqq 0.6B$

Fig. 71



$A \geqq 0.6B$

Fig. 72

(6) Compression strength and torque

Item	VTR operation mode	Measured reel	Measurement value	Remarks
Pressure roller compression strength	PLAY-PAUSE	————————	1.2 ± 0.2 kg	Note 1
Main brake torque	STOP	Supply & take-up reels	170g·cm or more	Note 2
Slack removal torque	Unloading	Supply reel	90～190g·cm	Note 2
F. FWD torque	Fast-forward	Take-up reel	400g·cm or more	Note 2
Rewind torque	Rewind	Supply reel	400g·cm or more	Note 2
Take-up torque	Play	Take-up reel	90～180g·cm	Note 2
Back tension	F. FWD	Supply reel	4～15g·cm	Note 3
	Rewind	Take-up reel		

Note 1:

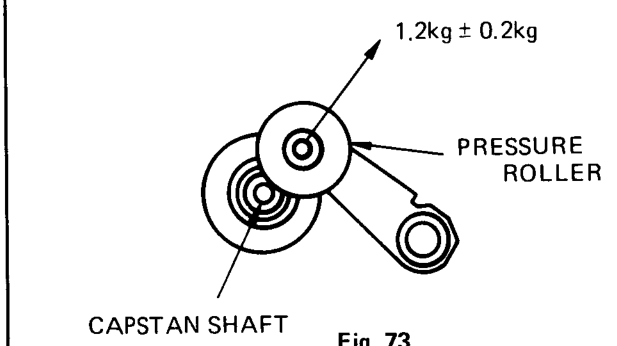

1.2kg ± 0.2kg
PRESSURE ROLLER
CAPSTAN SHAFT

Fig. 73

Note 2: The value measured while sliding the torque gauge at the speed of 0.8 rps using the torque gauge and the torque gauge adaptor.
However, the main brake torque shows the value when measured while turning the take-up reel clockwise and the supply reel, counterclockwise by hand at the speed of 0.8 rps.

Note 3: The value measured while drawing the take-up reel disk counterclockwise and the supply reel disk, clockwise at the speed of 50 mm/S using the dummy reel and fan type tension gauge.

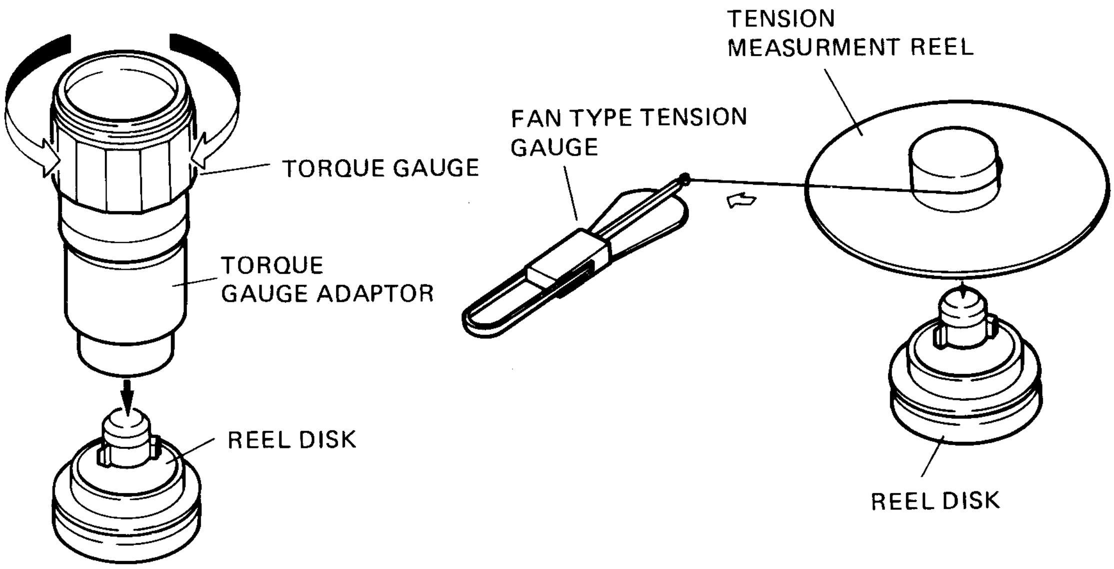

TENSION MEASURMENT REEL
FAN TYPE TENSION GAUGE
TORQUE GAUGE
TORQUE GAUGE ADAPTOR
REEL DISK
REEL DISK

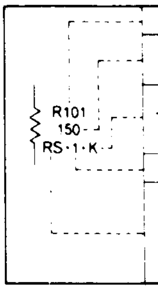
Fig. 74

DIAGRAMS

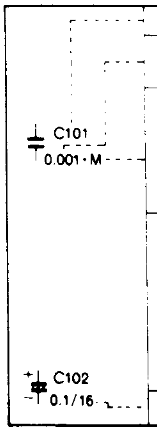
Note

1 Voltage measured at base of chassis with minimum volume control and no signal
( ) are shown in recording condition

2 Nomenclature of Resistors and Capacitors



Circuit No.	
Value	No indicated Ω(Ohm) M : 1000 kΩ
Tolerance	No indicated ±5% K : ±10% M : ±20%
Wattage	No indicated ¼W
Sort	No indicated Carbon film RC : Composition RW : Wire wound RS : Oxide metal film RN : Fixed metal film



Circuit No.		
Value	No indicated μF P : PF	
Tolerance	No indicated ±10% J : ± 5% M : ±20% Z : +80%, −20% D : ±0.5pF C : ±0.25pF	
Sort		Ceramic
		Electrolitic
	M	Mylar
	P	Polyester
	SL	Styrol
Voltage	No indicated 50WV	

3 Be sure to make your orders of resistors and capacitors with value, voltage, tolerance and sort

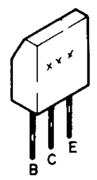
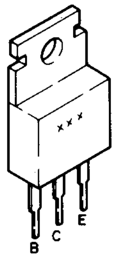
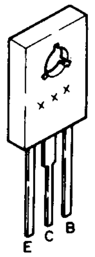
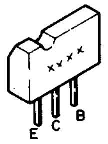
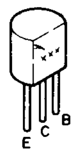
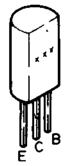
4 When replacing capacitors marked with * use specified ones stated on parts list since required temperature characteristics

Cautions on use of MOS IC

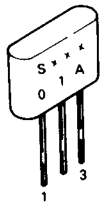
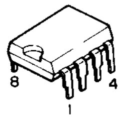
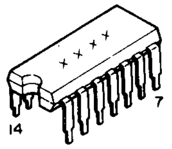
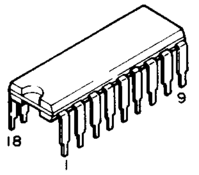
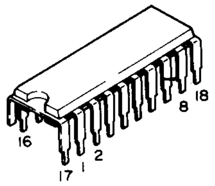
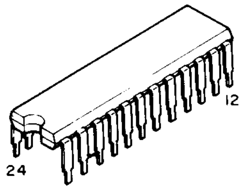
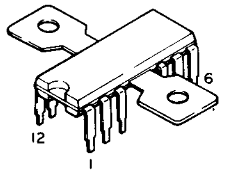
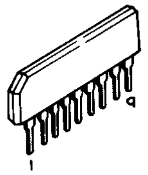
1. The MOS IC is inserted in black foam for shipment. This foam is a conductor which short-circuits between the leads to prevent damage. Do not remove ICs from this foam during their storage. Avoid removing ICs from this foam, placing them on plastic which is likely to be charged with static electricity or inserting them into styrol foam.
2. High voltages may be applied during soldering caused by leakages from the soldering iron, so be sure to ground the tip of the soldering iron or use a low voltage soldering iron.
3. The human body, clothes made of synthetic fibres or nylon gloves may be charged with several thousands volts of static electricity because of friction, so a workers should be grounded.
4. Be sure to ground measuring instruments such as oscilloscopes, VTVMs, etc. used for repairs.

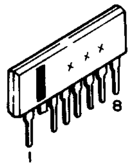
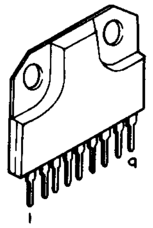
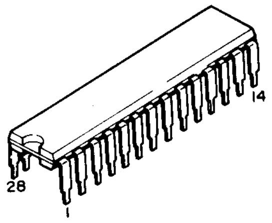
SEMICONDUCTOR CONFIGURATION

TRANSISTOR

1	2	3	4	5	6
					
2SA673	2SD972	2SB772 2SD882	2SC2021	2SA844 2SA952 2SC458 2SA1198	2SD468

IC

7	8	9	10
			
DN6838	MSL9378	BA6304	BA5102
11	**12**	**13**	**14**
			
HA11749	μPC1368	HA13402	NJD6506

15	16	17
		
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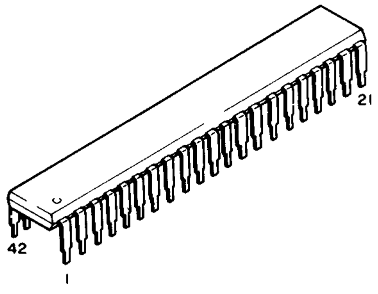
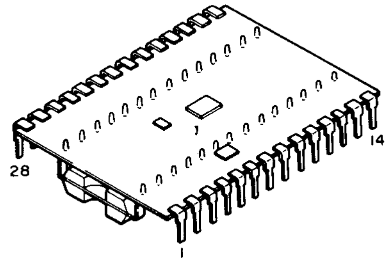
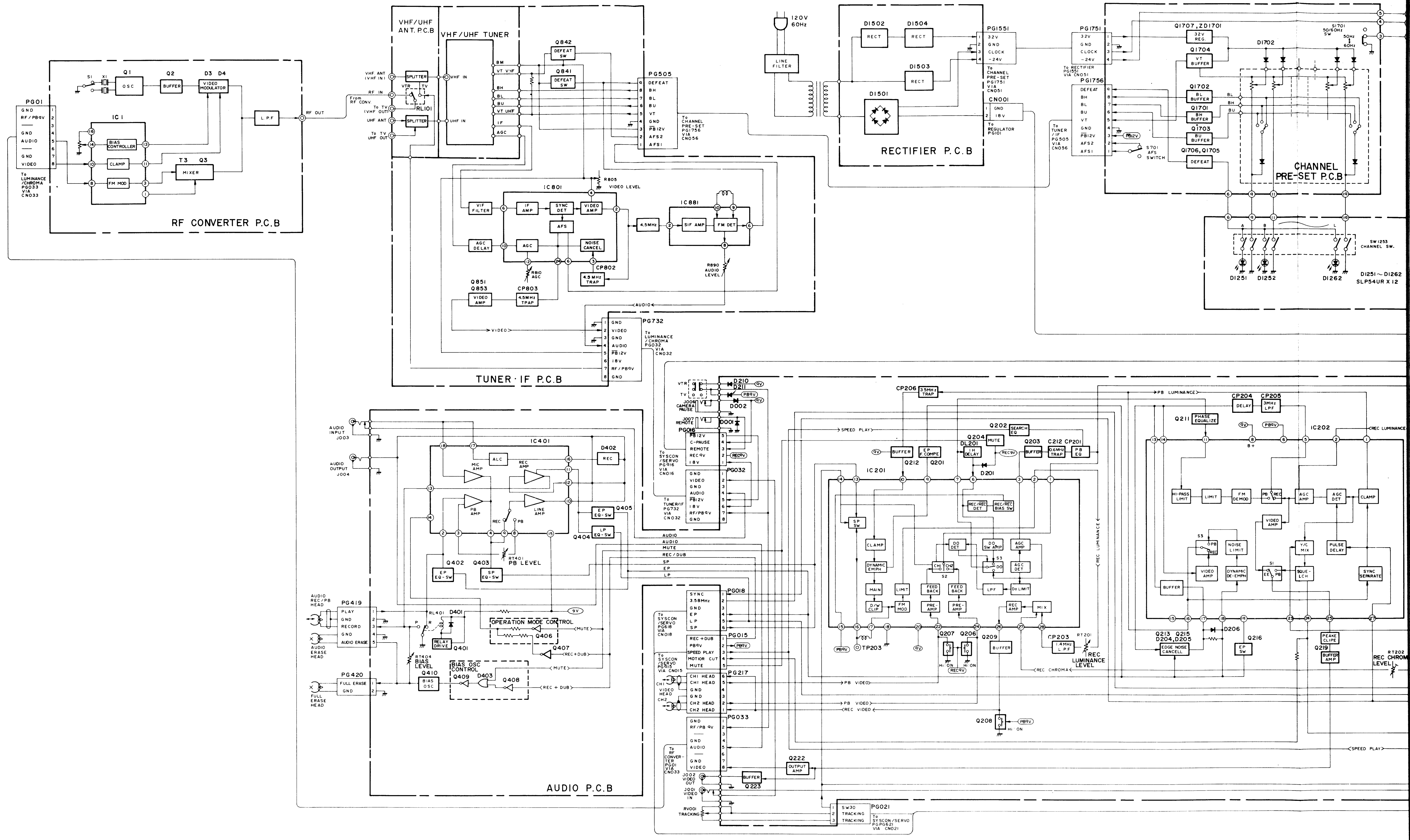
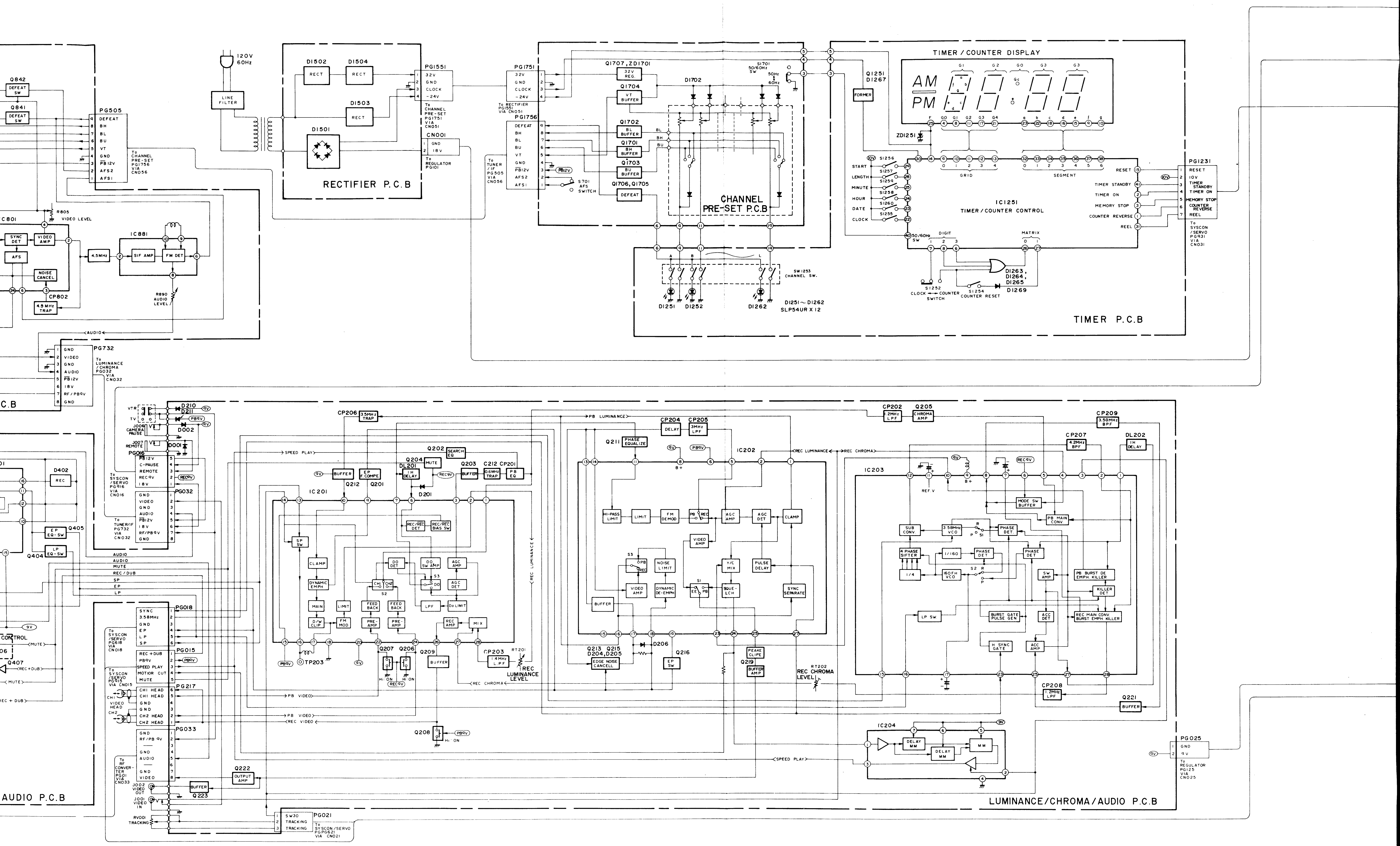
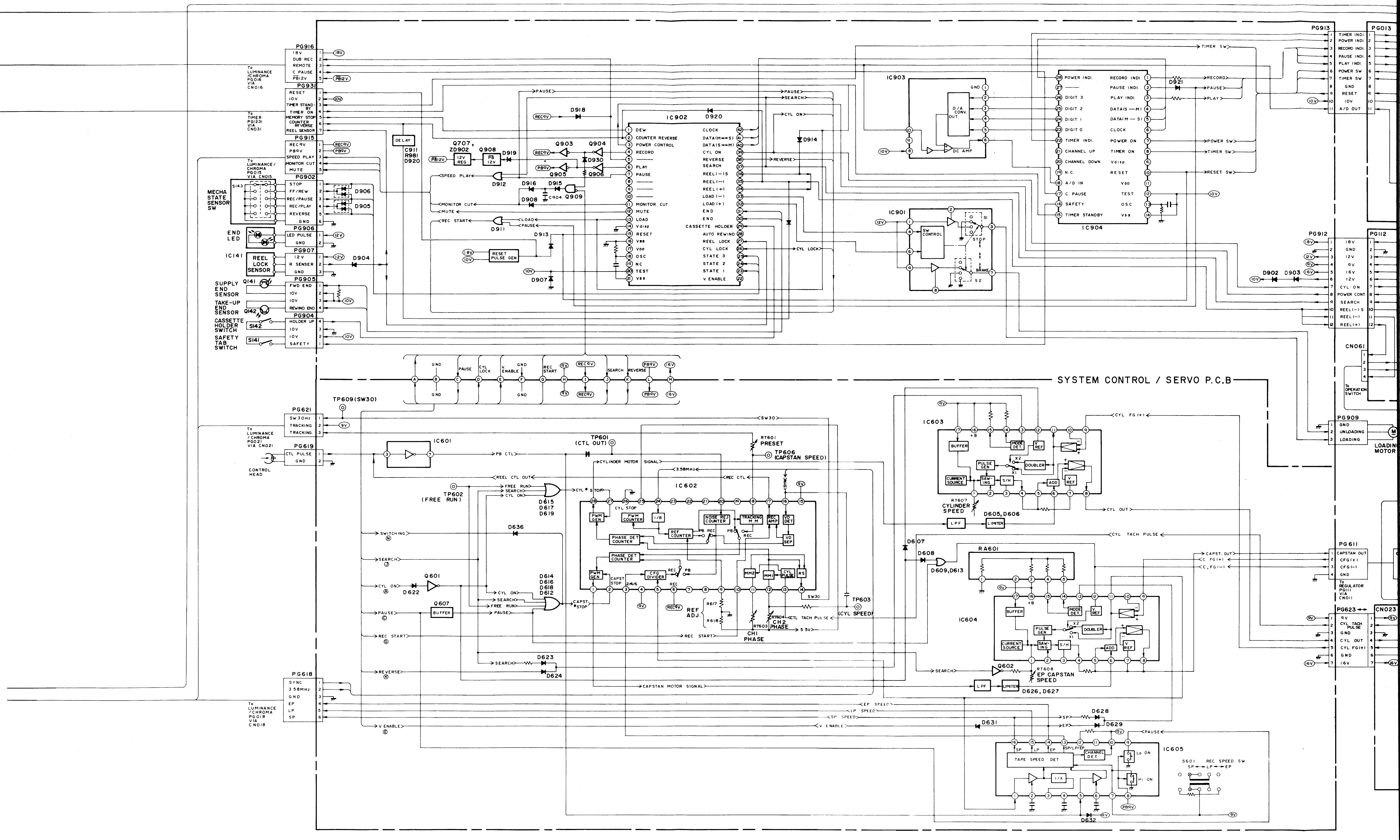
18	**19**	
		
HD38750	HT42XX	

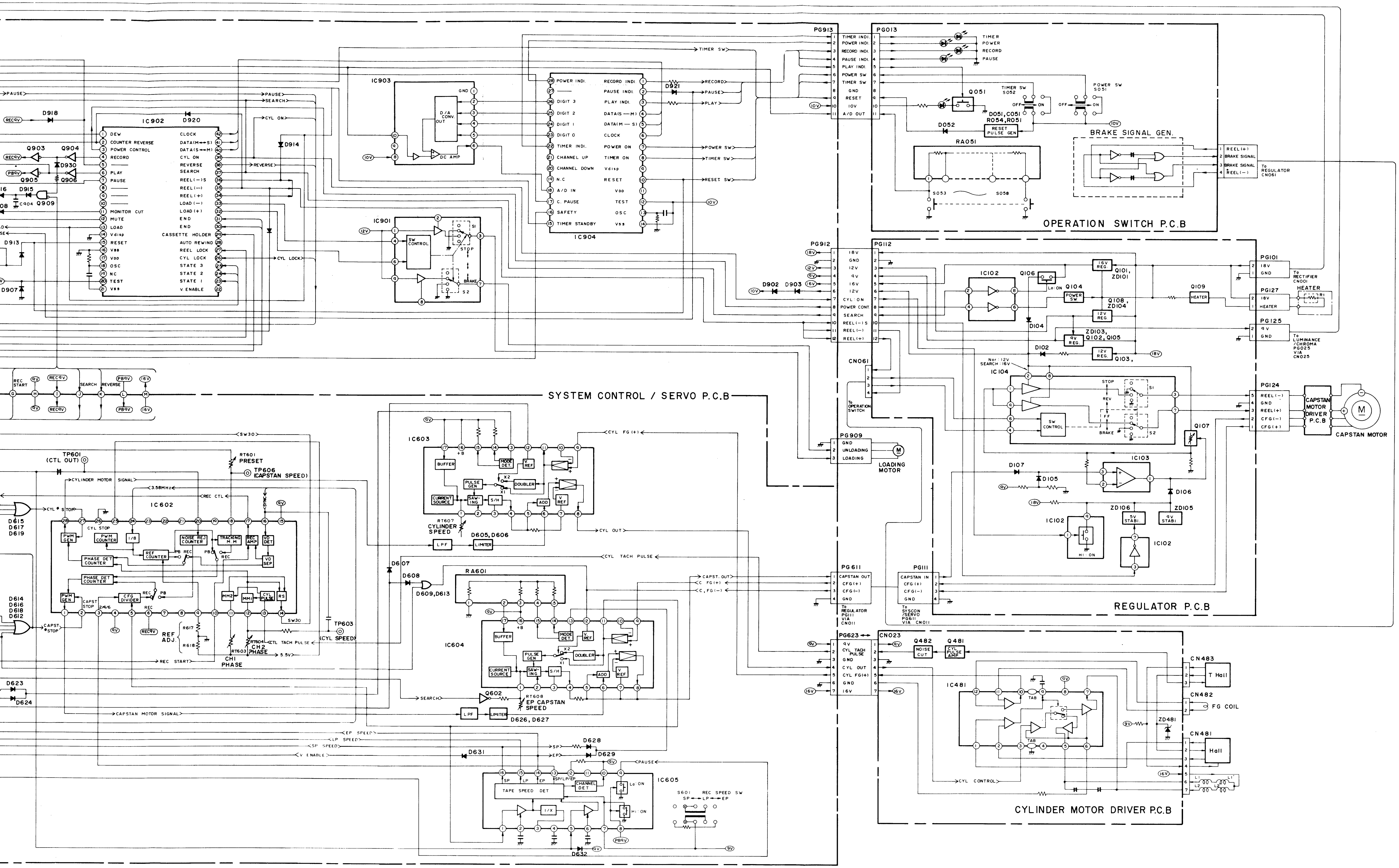
MEMO

OVERALL BLOCK DIAGRAM


PG01
GND
RF/PB9V
GND
AUDIO
GND
VIDEO
To LUMINANCE /CHROMA PG033 VIA CN033
S1
X1
Q1
OSC
Q2
BUFFER
D3 D4
VIDEO MODULATOR
IC1
BIAS CONTROLLER
CLAMP
FM MOD
T3 Q3
MIXER
L.P.F
RF OUT
RF CONVERTER P.C.B
VHF/UHF ANT. P.C.B
VHF/UHF TUNER
VHF ANT (VHF IN)
RF IN
From RF CONV.
To TV (VHF OUT)
UHF ANT
To TV UHF OUT
SPLITTER
VTR
TV
RL101
VHF IN
UHF IN
BM
VT VHF
BH
BL
BU
VT UHF
IF
AGC
Q842
DEFEAT SW
Q841
DEFEAT SW
PG505
DEFEAT
BH
BL
BU
VT
GND
PB12V
AFS2
AFS1
To CHANNEL PRE-SET PG1756 VIA CN056
R805 VIDEO LEVEL
IC801
VIF FILTER
IF AMP
SYNC DET
VIDEO AMP
AFS
AGC DELAY
AGC
NOISE CANCEL
R810 AGC
CP802
4.5MHz TRAP
4.5MHz
IC881
SIF AMP
FM DET
R890 AUDIO LEVEL
Q851
Q853
VIDEO AMP
CP803
4.5MHz TRAP
AUDIO
VIDEO
PG732
GND
VIDEO
GND
AUDIO
PB12V
18V
RF/PB9V
GND
To LUMINANCE /CHROMA PG032 VIA CN032
TUNER · IF P.C.B
120V 60Hz
LINE FILTER
D1502
D1504
RECT
D1503
D1501
PG1551
32V
GND
CLOCK
-24V
To CHANNEL PRE-SET PG1751 VIA CN051
CN001
GND
18V
To REGULATOR PG101
RECTIFIER P.C.B
PG1751
32V
GND
CLOCK
-24V
To RECTIFIER PG1551 VIA CN051
PG1756
DEFEAT
BH
BL
BU
VT
GND
PB12V
AFS2
AFS1
To TUNER /IF PG505 VIA CN056
S701 AFS SWITCH
Q1707, ZD1701
32V REG.
Q1704
VT BUFFER
Q1702
BL BUFFER
Q1701
BH BUFFER
Q1703
BU BUFFER
Q1706, Q1705
DEFEAT
D1702
S1701 50/60Hz SW
50Hz
60Hz
CHANNEL PRE-SET P.C.B
SW1253 CHANNEL SW.
D1251
D1252
D1262
D1251~D1262 SLP54UR X 12
AUDIO INPUT J003
AUDIO OUTPUT J004
IC401
MIC AMP
ALC
REC AMP
PB AMP
LINE AMP
D402
REC
EP EQ-SW
Q405
LP EQ-SW
Q404
Q402
EP EQ-SW
Q403
SP EQ-SW
RT401 PB LEVEL
AUDIO REC/PB HEAD
PG419
PLAY
GND
RECORD
GND
AUDIO ERASE
AUDIO ERASE HEAD
RL401
D401
RELAY DRIVE
Q401
OPERATION MODE CONTROL
Q406
Q407
MUTE
REC+DUB
RT404 BIAS LEVEL
Q410
BIAS OSC
BIAS OSC CONTROL
Q409
D403
Q408
PG420
FULL ERASE
GND
FULL ERASE HEAD
AUDIO P.C.B
VTR
TV
D210
D211
D002
J006 CAMERA PAUSE
J007 REMOTE
D001
PG016
PB12V
C-PAUSE
REMOTE
REC9V
18V
To SYSCON /SERVO PG916 VIA CN016
PG032
GND
VIDEO
GND
AUDIO
PB12V
18V
RF/PB9V
GND
To TUNER/IF PG732 VIA CN032
AUDIO
MUTE
REC/DUB
SP
EP
LP
PG018
SYNC
3.58MHz
GND
EP
LP
SP
To SYSCON /SERVO PG618 VIA CN018
PG015
REC+DUB
PB9V
SPEED PLAY
MOTOR CUT
MUTE
To SYSCON /SERVO PG915 VIA CN015
PG217
CH1 HEAD
GND
CH2 HEAD
CH1 VIDEO HEAD CH2
PG033
GND
RF/PB 9V
GND
AUDIO
GND
VIDEO
To RF CONVERTER PG01 VIA CN033
J002 VIDEO OUT
J001 VIDEO IN
RV001 TRACKING
BUFFER
Q223
Q222
OUTPUT AMP
PG021
SW30
TRACKING
To SYSCON/SERVO PG,PG621 VIA CN021
CP206
3.58MHz TRAP
SPEED PLAY
Q202
SEARCH EQ
Q204
MUTE
DL201
1H DELAY
BUFFER
Q212
EP F.COMPE
Q201
D201
Q203
BUFFER
C212 CP201
0.6MHz TRAP
PB EQ
IC201
SP SW
CLAMP
DYNAMIC EMPH
MAIN
D/W CLIP
LIMIT
FM MOD
REC/REC DET
REC/REC BIAS SW
DO DET
DO SW AMP
AGC AMP
CH1 CH2
S3
AGC DET
S2
FEED BACK
PRE-AMP
LPF
DO LIMIT
REC AMP
MIX
TP203
Q207
Q206
HI-ON
Q209
BUFFER
CP203
1.4MHz L.P.F
RT201
REC LUMINANCE LEVEL
REC CHROMA
PB VIDEO
REC VIDEO
Q208
HI ON
REC LUMINANCE
PB LUMINANCE
CP204
DELAY
CP205
3MHz LPF
Q211
PHASE EQUALIZE
IC202
B+
HI-PASS LIMIT
LIMIT
FM DEMOD
PB REC
AGC AMP
AGC DET
CLAMP
VIDEO AMP
Y/C MIX
PULSE DELAY
NOISE LIMIT
VIDEO AMP
DYNAMIC DE-EMPH
S1
EE PB
SQUE-LCH
SYNC SEPARATE
BUFFER
Q213 Q215
D204, D205
EDGE NOISE CANCELL
D206
Q216
EP SW
PEAKE CLIPE
Q219
BUFFER AMP
RT202
REC CHROM
LEVEL
PB9V
REC9V
9V
PB12V

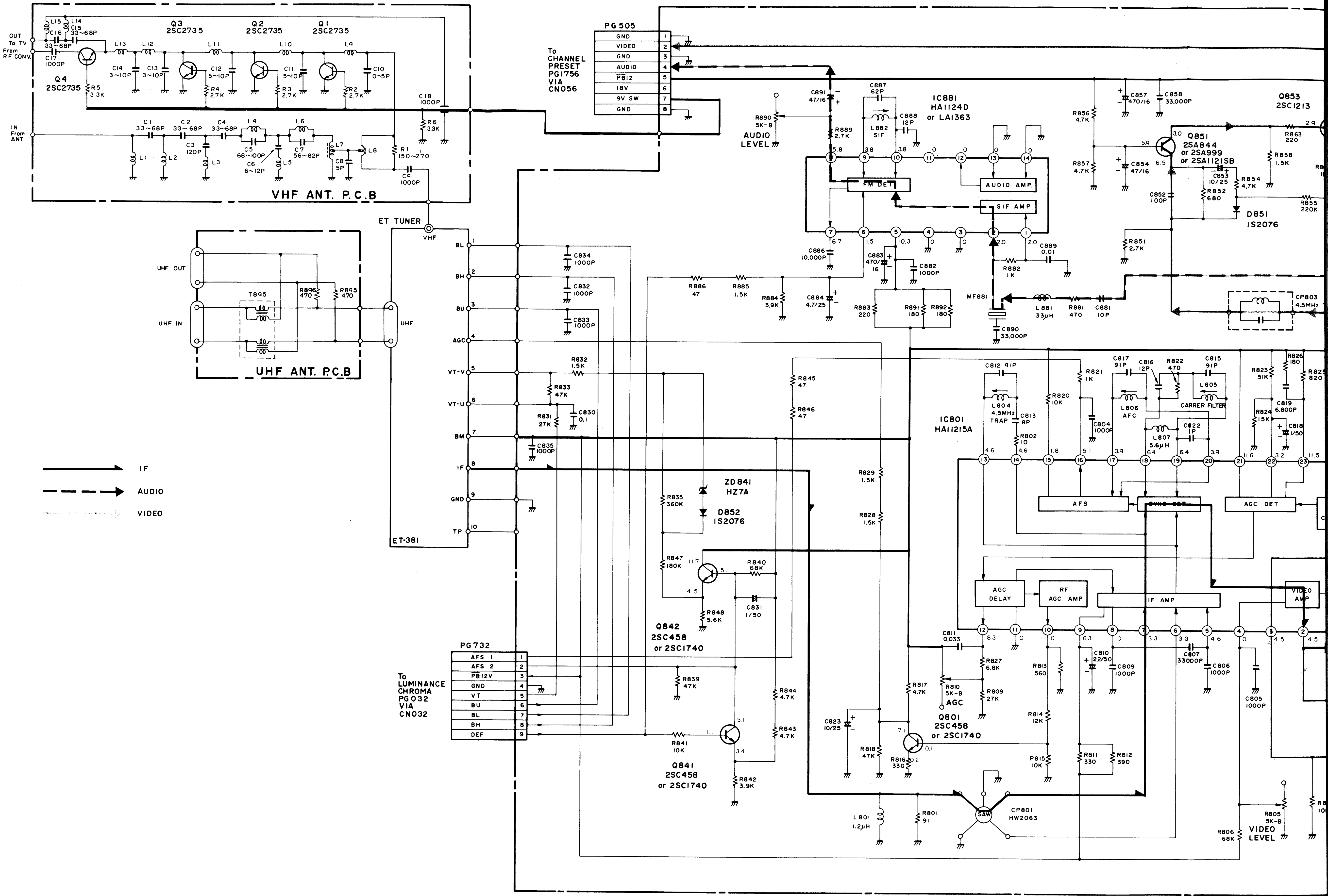

120V 60Hz
LINE FILTER
D1502
D1504
RECT
D1503
D1501
PG1551
32V
GND
CLOCK
-24V
To CHANNEL PRE-SET PG1751 VIA CN051
CN001
GND
18V
To REGULATOR PG101
RECTIFIER P.C.B
PG1751
To RECTIFIER PG1551 VIA CN051
PG1756
DEFEAT
BH
BL
BU
VT
GND
PB12V
AFS2
AFS1
To TUNER/IF PG505 VIA CN056
S701 AFS SWITCH
Q1707, ZD1701
32V REG.
Q1704
VT BUFFER
Q1702
BL BUFFER
Q1701
BH BUFFER
Q1703
BU BUFFER
Q1706, Q1705
DEFEAT
D1702
S1701 50/60Hz SW
50Hz
60Hz
CHANNEL PRE-SET P.C.B
SW1253 CHANNEL SW.
D1251
D1252
D1262
D1251 ~ D1262 SLP54UR X 12
TIMER / COUNTER DISPLAY
AM
PM
G1
G2
G0
G3
Q1251 D1267
FORMER
ZD1251
GRID
SEGMENT
S1256
S1257
S1259
S1258
S1260
S1255
START
LENGTH
MINUTE
HOUR
DATE
CLOCK
10V
IC1251
TIMER / COUNTER CONTROL
RESET
TIMER STANDBY
TIMER ON
MEMORY STOP
COUNTER REVERSE
REEL
PG1231
RESET
10V
TIMER STANDBY
TIMER ON
MEMORY STOP
COUNTER REVERSE
REEL
To SYSCON /SERVO PG931 VIA CN031
50/60Hz SW
DIGIT
MATRIX
D1263, D1264, D1265
D1269
S1252 CLOCK ⟷ COUNTER SWITCH
S1254 COUNTER RESET
TIMER P.C.B
Q842
DEFEAT SW
Q841
DEFEAT SW
PG505
DEFEAT
BH
BL
BU
VT
GND
PB12V
AFS2
AFS1
To CHANNEL PRE-SET PG1756 VIA CN056
R805 VIDEO LEVEL
IC801
SYNC DET
VIDEO AMP
AFS
NOISE CANCEL
CP802
4.5MHz TRAP
4.5MHz
IC881
SIF AMP
FM DET
R890 AUDIO LEVEL
AUDIO
PG732
GND
VIDEO
GND
AUDIO
PB12V
18V
RF/PB9V
GND
To LUMINANCE /CHROMA PG032 VIA CN032
P.C.B
D402
REC
Q405
EP EQ-SW
Q404
LP EQ-SW
VTR
TV
J006 CAMERA PAUSE
J007 REMOTE
D210
D211
D002
D001
9V
PB9V
PG016
PB12V
C-PAUSE
REMOTE
REC9V
18V
To SYSCON /SERVO PG916 VIA CN016
PG032
GND
VIDEO
GND
AUDIO
PB12V
18V
RF/PB9V
GND
To TUNER/IF PG732 VIA CN032
AUDIO
AUDIO
MUTE
REC/DUB
SP
EP
LP
PG018
SYNC
3.58MHz
GND
EP
LP
SP
To SYSCON /SERVO PG618 VIA CN018
CONTROL
MUTE
Q407
REC + DUB
PG015
REC + DUB
PB9V
SPEED PLAY
MOTOR CUT
MUTE
To SYSCON /SERVO PG915 VIA CN015
PG217
CH1 HEAD
CH1 HEAD
GND
GND
CH2 HEAD
CH2 HEAD
CH1
VIDEO HEAD
CH2
PG033
GND
RF/PB 9V
GND
AUDIO
GND
VIDEO
To RF CONVERTER PG01 VIA CN033
J002 VIDEO OUT
J001 VIDEO IN
RV001 TRACKING
AUDIO P.C.B
BUFFER
Q223
Q222
OUTPUT AMP
PG021
SW30
TRACKING
TRACKING
To SYSCON/SERVO PGPG621 VIA CN021
CP206
3.5MHz TRAP
SPEED PLAY
BUFFER
Q212
EP F.COMPE
Q201
Q202
SEARCH EQ
Q204
MUTE
DL201
1H DELAY
D201
Q203
BUFFER
C212
0.6MHz TRAP
CP201
PB EQ
REC9V
IC201
SP SW
CLAMP
DYNAMIC EMPH
MAIN
D/W CLIP
LIMIT
FM MOD
FEED BACK
PRE-AMP
REC/REC DET
REC/REC BIAS SW
DO DET
CH1
CH2
S2
DO SW AMP
S3
DO
AGC AMP
AGC DET
LPF
DO LIMIT
REC AMP
MIX
PB9V
TP203
Q207
Q206
HI ON
Q209
BUFFER
CP203
1.4MHz L.P.F
RT201 REC LUMINANCE LEVEL
REC LUMINANCE
REC CHROMA
PB VIDEO
PB VIDEO
REC VIDEO
Q208
PB LUMINANCE
CP204
DELAY
CP205
3MHz LPF
Q211
PHASE EQUALIZE
IC202
B+
REC LUMINANCE
REC CHROMA
HI-PASS LIMIT
LIMIT
FM DEMOD
PB
REC
AGC AMP
AGC DET
CLAMP
VIDEO AMP
S3
PB
REC
NOISE LIMIT
VIDEO AMP
DYNAMIC DE-EMPH
S1
EE
Y/C MIX
SQUELCH
PULSE DELAY
SYNC SEPARATE
BUFFER
D206
Q213 Q215 D204, D205
EDGE NOISE CANCELL
Q216
EP SW
PEAKE CLIPE
Q219
BUFFER AMP
RT202 REC CHROMA LEVEL
CP202
1.2MHz LPF
Q205
CHROMA AMP
CP209
3.58MHz BPF
CP207
4.2MHz BPF
DL202
1H DELAY
IC203
REF. V
MODE SW BUFFER
PB MAIN CONV.
SUB CONV
3.58MHz VCO
PHASE DET.
4 PHASE SIFTER
1/160
PHASE DET
PHASE DET
1/4
160FH VCO
SW AMP
PB BURST DE EMPH KILLER
KILLER DET
LP SW
BURST GATE PULSE GEN
ACC DET
REC MAIN CONV. BURST EMPH KILLER
H SYNC GATE
ACC AMP
CP208
1.2MHz LPF
Q221
BUFFER
IC204
DELAY MM
DELAY MM
MM
SPEED PLAY
PG025
GND
9V
To REGULATOR PG125 VIA CN025
LUMINANCE/CHROMA/AUDIO P.C.B

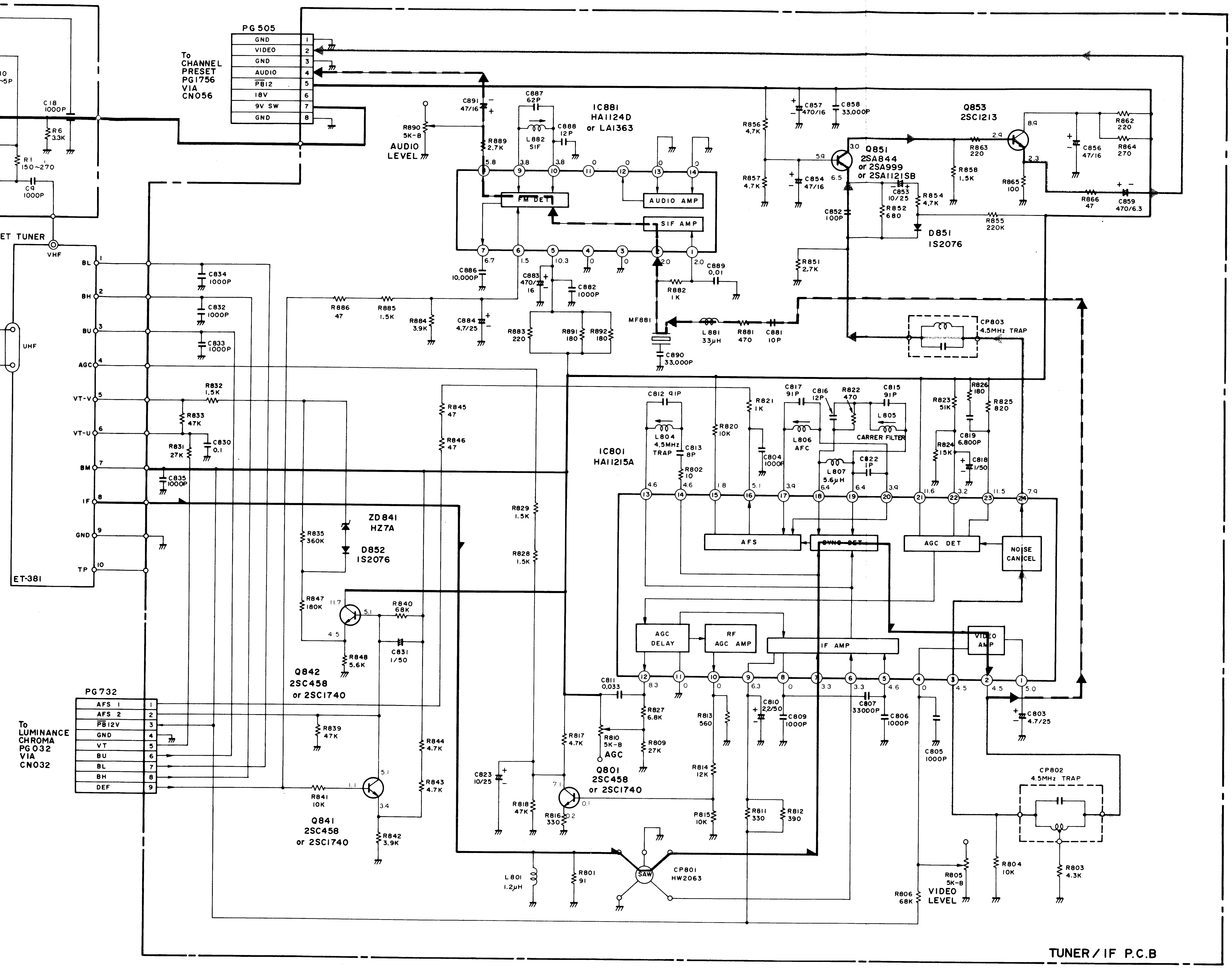

SYSTEM CONTROL / SERVO P.C.B
PG916
18V
DUB REC
REMOTE
C. PAUSE
PB12V
To LUMINANCE /CHROMA PG016 VIA CN016
PG931
RESET
10V
TIMER STAND-BY
TIMER ON
MEMORY STOP
COUNTER REVERSE
REEL SENSOR
To TIMER PG1231 VIA CN031
PG915
REC9V
PB9V
SPEED PLAY
MONITOR CUT
MUTE
To LUMINANCE/ CHROMA PG015 VIA CN015
PG902
STOP
FF/REW
REC/PAUSE
REC/PLAY
REVERSE
GND
S143
MECHA STATE SENSOR SW
D906
D905
PG906
LED PULSE
END LED
PG907
12V
R. SENSER
IC141
REEL LOCK SENSOR
D904
PG905
FWD END
REWIND END
SUPPLY END SENSOR
Q141
TAKE-UP END SENSOR
Q142
PG904
HOLDER UP
SAFETY
CASSETTE HOLDER SWITCH
S142
SAFETY TAB SWITCH
S141
DELAY
C911
R981
D920
Q707, ZD902
12V REG
Q908
PB 12V
D919
D918
Q903
Q904
D930
Q905
Q906
D912
D916
D915
D908
C904
Q909
D911
D913
RESET PULSE GEN
D907
IC902
DEW
COUNTER REVERSE
POWER CONTROL
RECORD
PLAY
PAUSE
MONITOR CUT
MUTE
LOAD
Vdisp
RESET
VBB
VDD
OSC
NC
TEST
VSS
CLOCK
DATA(M→S)
DATA(S→M)
CYL ON
REVERSE
SEARCH
REEL(−)S
REEL(−)
REEL(+)
LOAD(−)
LOAD(+)
END
CASSETTE HOLDER
AUTO REWIND
REEL LOCK
CYL LOCK
STATE 3
STATE 2
STATE 1
V. ENABLE
D914
IC903
D/A CONV.
DC AMP
IC901
SW CONTROL
S1
STOP
BRAKE
S2
IC904
POWER INDI.
DIGIT 3
DIGIT 2
DIGIT 1
DIGIT 0
TIMER INDI.
CHANNEL UP
CHANNEL DOWN
N.C
A/D IN
C. PAUSE
SAFETY
TIMER STANDBY
RECORD INDI.
PAUSE INDI.
PLAY INDI.
DATA(S→M)
DATA(M→S)
POWER ON
TIMER ON
D921
RECORD
PAUSE
PLAY
POWER SW
TIMER SW
RESET SW
PG913
TIMER INDI.
POWER INDI.
RECORD INDI.
PAUSE INDI.
PLAY INDI.
POWER SW
TIMER SW
GND
RESET
10V
A/D OUT
PG013
PG912
18V
GND
12V
9V
16V
CYL. ON
POWER CONT.
SEARCH
REEL(−)S
REEL(−)
REEL(+)
D902
D903
PG112
CN061
To OPERATION SWITCH
PG909
GND
UNLOADING
LOADING
LOADING MOTOR
TP609(SW30)
PG621
SW30Hz
TRACKING
To LUMINANCE /CHROMA PG021 VIA CN021
PG619
CTL PULSE
CONTROL HEAD
IC601
PB CTL
TP601 (CTL OUT)
CYLINDER MOTOR SIGNAL
REEL CTL OUT
TP602 (FREE RUN)
FREE RUN
SEARCH
CYL ON
CYL STOP
D615
D617
D619
D636
SWITCHING
Q601
D622
D614
D616
D618
D612
CAPST STOP
Q607
BUFFER
PAUSE
REC START
REVERSE
D623
D624
CAPSTAN MOTOR SIGNAL
V ENABLE
PG618
SYNC
3.58MHz
EP
LP
SP
To LUMINANCE /CHROMA PG018 VIA CN018
IC602
RT601 PRESET
TP606 (CAPSTAN SPEED)
3.58MHz
REC CTL
PWM GEN
PWM COUNTER
1/8
NOISE REJ COUNTER
TRACKING M M
REC AMP
VD DET
VD SEP
REF COUNTER
PHASE DET COUNTER
CFG DIVIDER
MM2
MM1
CYL PHASE
RS
REF ADJ.
R617
R618
RT603
CH1 PHASE
RT604
CH2 PHASE
CTL TACH PULSE
5.5V
TP603 (CYL SPEED)
SW30
IC603
BUFFER
MODE DET
V REF
PULSE GEN
DOUBLER
CURRENT SOURCE
SAW-ING
S/H
ADD
RT607 CYLINDER SPEED
D605, D606
LPF
LIMITER
CYL FG(+)
CYL OUT
CYL TACH PULSE
D607
D608
D609, D613
RA601
IC604
RT608 EP CAPSTAN SPEED
Q602
D626, D627
PG611
CAPSTAN OUT
CFG(+)
CFG(−)
To REGULATOR PG111 VIA CN011
PG623
CYL TACH PULSE
CYL OUT
CYL FG(+)
16V
CN023
D628
D629
D631
IC605
TAPE SPEED DET
CHANNEL DET
1/X
Lo ON
Hi ON
D632
S601 REC SPEED SW
SP LP EP
A B C D E F G H I J K L M
V ENABLE
REC START

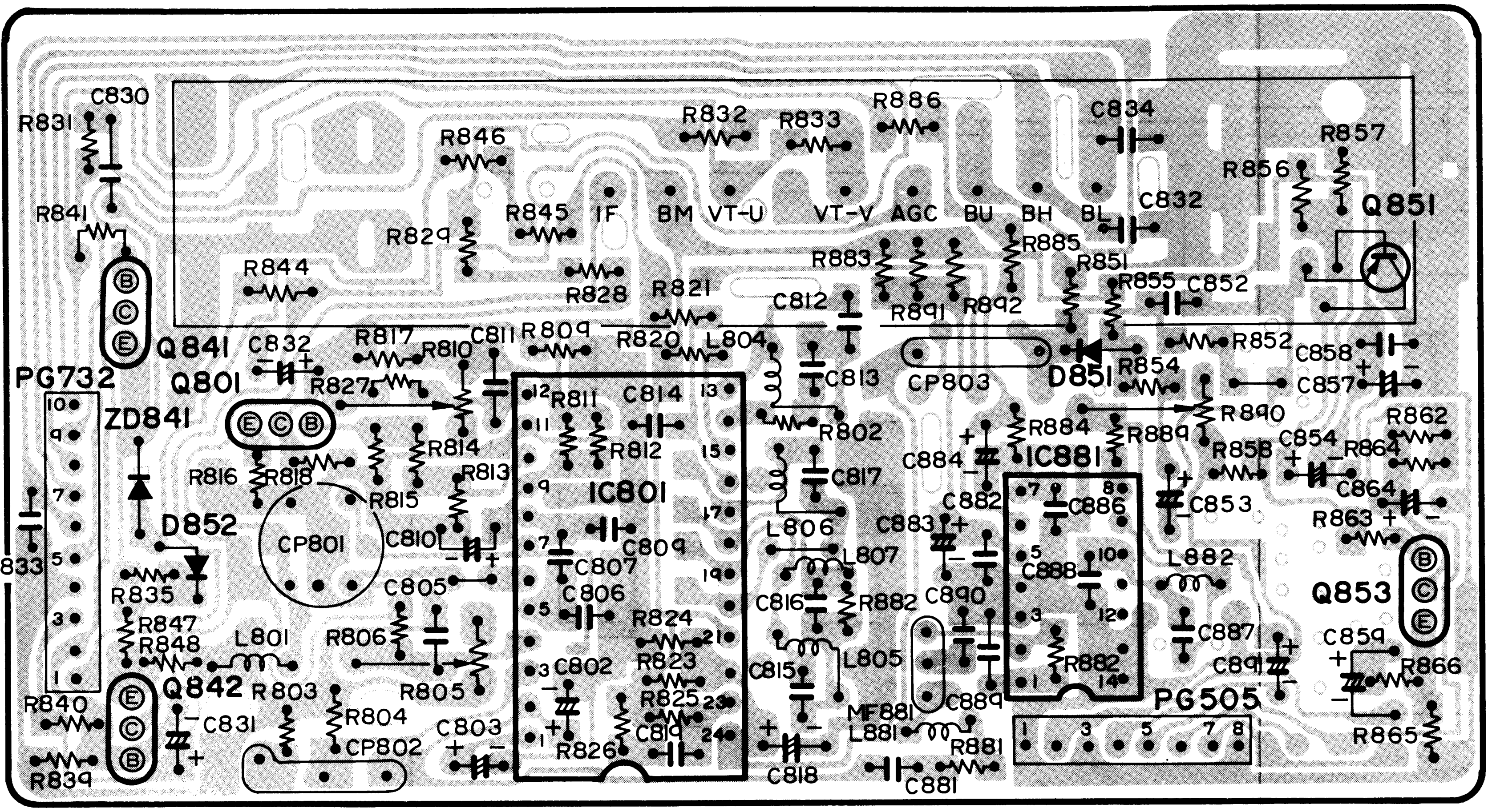


SYSTEM CONTROL / SERVO P.C.B
OPERATION SWITCH P.C.B
REGULATOR P.C.B
CYLINDER MOTOR DRIVER P.C.B
IC902
IC903
IC904
IC901
IC602
IC603
IC604
IC605
IC102
IC103
IC104
IC481
PG913
PG013
PG912
PG112
PG909
PG611
PG111
PG623
CN023
CN061
PG101
PG127
PG125
PG124
CN483
CN482
CN481
TIMER
POWER
RECORD
PAUSE
BRAKE SIGNAL GEN.
RA051
RA601
S053
S058
Q051
D051, C051
R054, R051
RESET PULSE GEN
D052
TIMER SW S052
POWER SW S051
LOADING MOTOR
CAPSTAN MOTOR
CAPSTAN MOTOR DRIVER P.C.B
HEATER
T Hall
FG COIL
Hall
TP601 (CTL OUT)
RT601 PRESET
TP606 (CAPSTAN SPEED)
TP603 (CYL SPEED)
RT607 CYLINDER SPEED
RT608 EP CAPSTAN SPEED
REF ADJ.
CH1 PHASE
CH2 PHASE
S601 REC SPEED SW SP LP EP
TAPE SPEED DET
CHANNEL DET
To RECTIFIER CN001
To LUMINANCE /CHROMA PG025 VIA CN025
To REGULATOR CN061
To REGULATOR PG111 VIA CN011
To SYSCON /SERVO PG611 VIA CN011
To OPERATION SWITCH

TUNER/IF


VHF ANT. P.C.B
OUT To TV
From RF CONV.
IN From ANT.
Q4 2SC2735
Q3 2SC2735
Q2 2SC2735
Q1 2SC2735
L15 L14 C16 C15 33~68P
C17 1000P
R5 3.3K
L13 L12 L11 L10 L9
C14 3~10P
C13 3~10P
C12 5~10P
C11 5~10P
C10 0~5P
R4 2.7K
R3 2.7K
R2 2.7K
C18 1000P
R6 3.3K
C1 33~68P
C2 33~68P
C4 33~68P
C3 120P
L1 L2 L3 L4 L5 L6 L7 L8
C5 68~100P
C6 6~12P
C7 56~82P
C8 5P
R1 150~270
C9 1000P
ET TUNER
VHF
UHF ANT. P.C.B
UHF OUT
UHF IN
UHF
T895
R896 470
R895 470
ET-381
BL BH BU AGC VT-V VT-U BM IF GND TP
C834 1000P
C832 1000P
C833 1000P
R832 1.5K
R833 47K
R831 27K
C830 0.1
C835 1000P
IF
AUDIO
VIDEO
PG505
GND VIDEO GND AUDIO PB12 18V 9V SW GND
To CHANNEL PRESET PG1756 VIA CN056
C891 47/16
R890 5K-B AUDIO LEVEL
R889 2.7K
C887 62P
L882 SIF
C888 12P
IC881 HA1124D or LA1363
FM DET
AUDIO AMP
SIF AMP
C886 10,000P
C883 470/16
C882 1000P
C889 0.01
R882 1K
R886 47
R885 1.5K
R884 3.9K
C884 4.7/25
R883 220
R891 180
R892 180
MF881
L881 33μH
R881 470
C881 10P
C890 33,000P
R856 4.7K
C857 470/16
C858 33,000P
Q853 2SC1213
Q851 2SA844 or 2SA999 or 2SA1121SB
R857 4.7K
C854 47/16
C852 100P
C853 10/25
R852 680
R854 4.7K
R858 1.5K
R863 220
R855 220K
D851 1S2076
R851 2.7K
CP803 4.5MHz
IC801 HA11215A
C812 91P
L804 4.5MHz TRAP
C813 8P
R802 10
R820 10K
R821 1K
C804 1000P
C817 91P
C816 12P
R822 470
C815 91P
L806 AFC
L805 CARRIER FILTER
L807 5.6μH
C822 1P
R823 51K
R826 180
R825 820
C819 6,800P
R824 15K
C818 1/50
AFS
SYNC DET
AGC DET
AGC DELAY
RF AGC AMP
IF AMP
VIDEO AMP
R845 47
R846 47
R829 1.5K
R828 1.5K
ZD841 HZ7A
D852 1S2076
R835 360K
R847 180K
R840 68K
C831 1/50
R848 5.6K
Q842 2SC458 or 2SC1740
PG732
AFS 1 AFS 2 PB12V GND VT BU BL BH DEF
To LUMINANCE CHROMA PG032 VIA CN032
R839 47K
R844 4.7K
R843 4.7K
R841 10K
Q841 2SC458 or 2SC1740
R842 3.9K
C811 0.033
R827 6.8K
R810 5K-B AGC
R809 27K
R817 4.7K
Q801 2SC458 or 2SC1740
R818 47K
R816 330
C823 10/25
R813 560
R814 12K
R815 10K
C810 22/50
C809 1000P
R811 330
R812 390
C807 33000P
C806 1000P
C805 1000P
L801 1.2μH
R801 91
SAW
CP801 HW2063
R806 68K
R805 5K-B VIDEO LEVEL


PG505
GND
VIDEO
GND
AUDIO
PB12
18V
9V SW
GND
To CHANNEL PRESET PG1756 VIA CN056
C18 1000P
R6 3.3K
R1 150~270
C9 1000P
ET TUNER
VHF
UHF
BL
BH
BU
AGC
VT-V
VT-U
BM
IF
GND
TP
ET-381
C834 1000P
C832 1000P
C833 1000P
R832 1.5K
R833 47K
R831 27K
C830 0.1
C835 1000P
C891 47/16
R890 5K-B
AUDIO LEVEL
R889 2.7K
C887 62P
L882 SIF
C888 12P
IC881 HA1124D or LA1363
FM DET
AUDIO AMP
SIF AMP
C886 10,000P
C883 470/16
C882 1000P
R882 1K
C889 0.01
R886 47
R885 1.5K
R884 3.9K
C884 4.7/25
R883 220
R891 180
R892 180
MF881
L881 33μH
R881 470
C881 10P
C890 33,000P
R856 4.7K
C857 470/16
C858 33,000P
R857 4.7K
C854 47/16
C852 100P
R851 2.7K
Q851 2SA844 or 2SA999 or 2SA1121SB
C853 10/25
R852 680
R854 4.7K
D851 1S2076
Q853 2SC1213
R863 220
R858 1.5K
C856 47/16
R862 220
R864 270
R865 100
R866 47
C859 470/6.3
R855 220K
CP803 4.5MHz TRAP
R845 47
R846 47
C812 91P
L804 4.5MHz TRAP
C813 8P
R802 10
R820 10K
R821 1K
C804 1000P
C817 91P
C816 12P
R822 470
C815 91P
L806 AFC
L805 CARRIER FILTER
L807 5.6μH
C822 1P
R823 51K
R826 180
R825 820
C819 6,800P
R824 15K
C818 1/50
IC801 HA11215A
AFS
SYNC DET
AGC DET
NOISE CANCEL
AGC DELAY
RF AGC AMP
IF AMP
VIDEO AMP
ZD841 HZ7A
D852 1S2076
R835 360K
R847 180K
R840 68K
R848 5.6K
C831 1/50
Q842 2SC458 or 2SC1740
R829 1.5K
R828 1.5K
C811 0.033
R827 6.8K
R810 5K-B AGC
R809 27K
R813 560
C810 22/50
C809 1000P
C807 33000P
C806 1000P
C805 1000P
C803 4.7/25
R814 12K
R815 10K
R811 330
R812 390
PG732
AFS 1
AFS 2
PB12V
GND
VT
BU
BL
BH
DEF
To LUMINANCE CHROMA PG032 VIA CN032
R839 47K
R844 4.7K
R843 4.7K
R841 10K
Q841 2SC458 or 2SC1740
R842 3.9K
C823 10/25
R817 4.7K
Q801 2SC458 or 2SC1740
R818 47K
R816 330
L801 1.2μH
R801 91
SAW
CP801 HW2063
CP802 4.5MHz TRAP
R806 68K
R805 5K-B VIDEO LEVEL
R804 10K
R803 4.3K
TUNER / IF P.C.B


C830
R831
R846
R832
R833
R886
C834
R857
R856
Q851
C832
R845
IF
BM
VT-U
VT-V
AGC
BU
BH
BL
R841
R829
R883
R885
R851
R855
C852
R844
R828
R821
C812
R891
R892
Q841
C832
R817
R810
C811
R809
R820
L804
R852
C858
PG732
Q801
R827
C813
CP803
D851
R854
C857
ZD841
R811
C814
R802
R884
R889
R840
R862
R814
R812
C884
IC881
R858
C854
R864
R816
R818
R813
IC801
C817
C882
C886
C853
C864
R815
R863
D852
C810
L806
C883
CP801
C809
L807
C888
L882
C833
C807
C890
Q853
R835
C805
C806
C816
R882
R847
R824
C887
C859
R848
L801
R806
L805
R866
C891
R840
Q842
R803
R805
C802
R823
C815
R862
C831
R804
R825
MF881
C889
PG505
CP802
C803
C819
L881
R865
R839
R826
C818
R881
C881

IF P.C.B

IC801

12	8.3	13	4.6
11	0	14	4.6
10	0	15	1.8
9	6.3	16	5.1
8	0	17	3.9
7	3.3	18	6.4
6	3.3	19	6.4
5	4.6	20	3.9
4	0	21	11.6
3	4.5	22	3.2
2	4.5	23	11.5
1	5.0	24	7.9

IC881

7	6.7	8	3.8
6	1.5	9	3.8
5	10.3	10	3.8
4	0	11	0
3	0	12	0
2	2.0	13	0
1	2.0	14	0

PG505

1	GND
2	VIDEO OUT
3	GND
4	AUDIO
5	$\overline{\text{PB}}$12V
6	18V
7	9V SW
8	GND

To
CHANNEL
PRESET
PG1756
VIA
CN056

PG732

10	——
9	DEF
8	BH
7	BL
6	BU
5	VT
4	GND
3	$\overline{\text{PB}}$12V
2	AFS2
1	AFS1

To
LUMINANCE
CHROMA
PG032
VIA
CN032

Q801

B	0.1
C	7.1
E	0.2

Q841

B	1.1
C	5.1
E	3.4

Q842

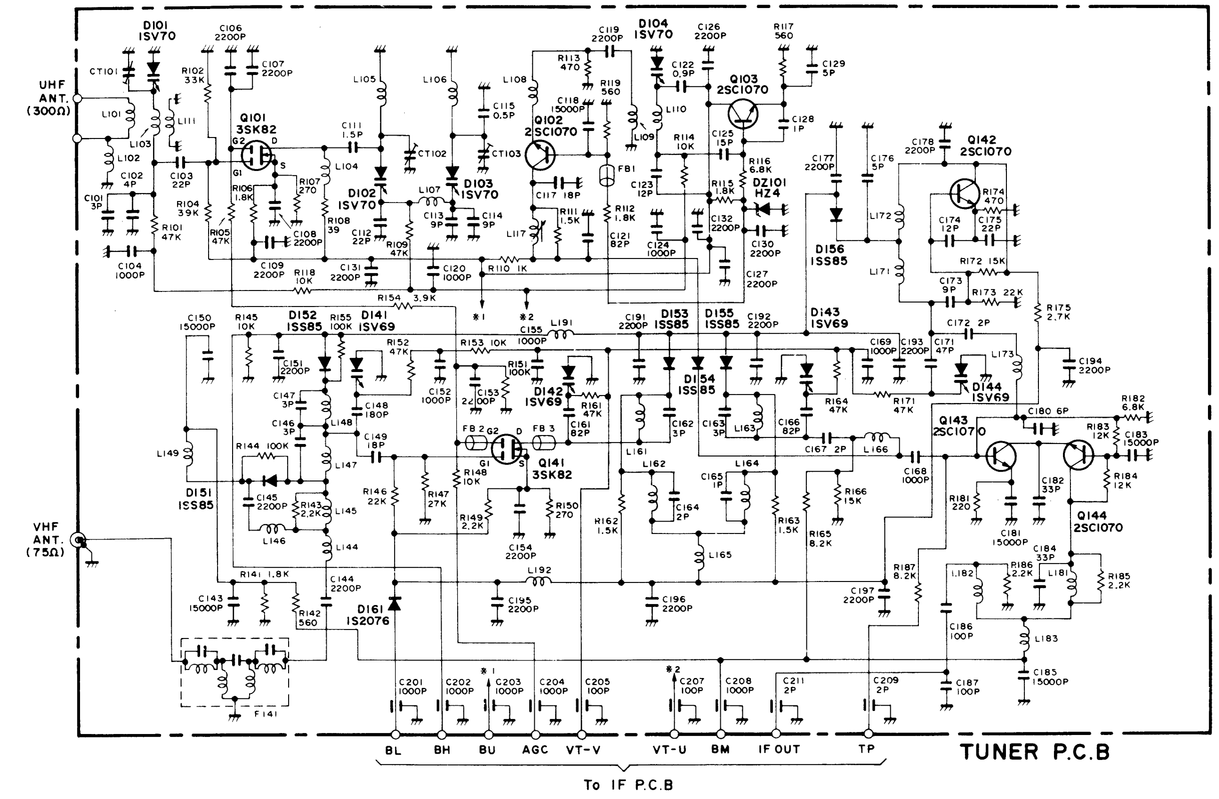
B	5.1
C	11.7
E	4.5

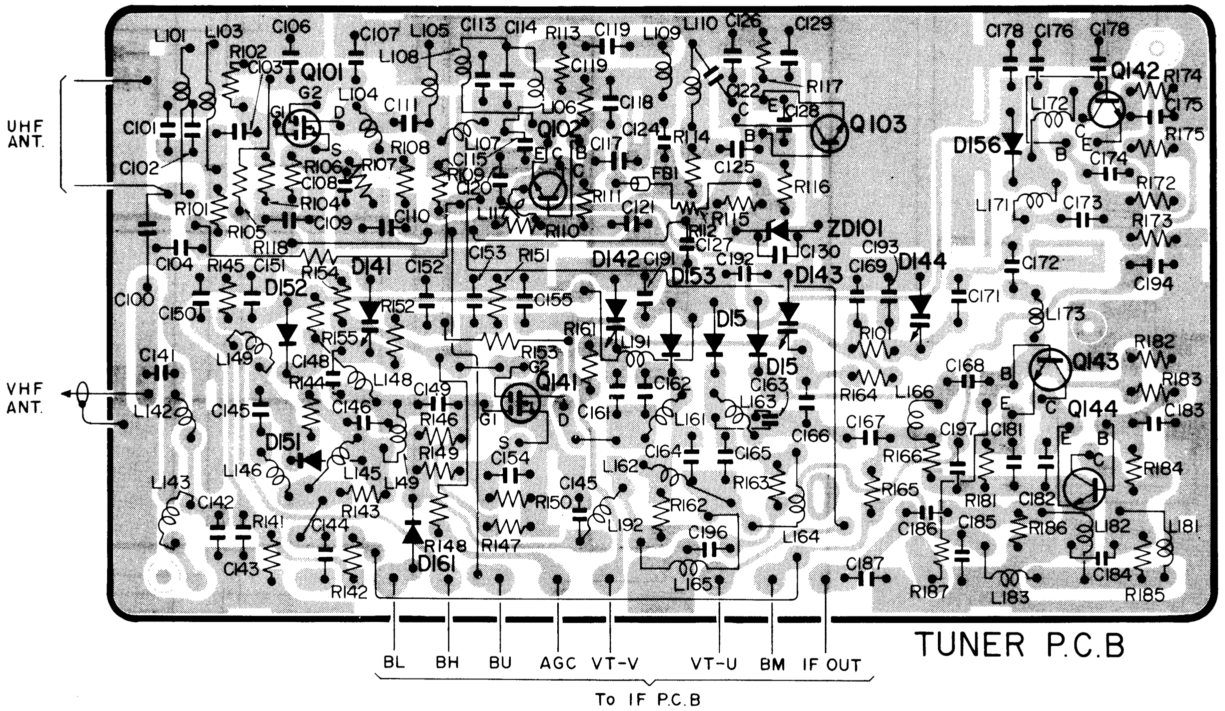
Q851

B	5.9
C	3.0
E	6.5

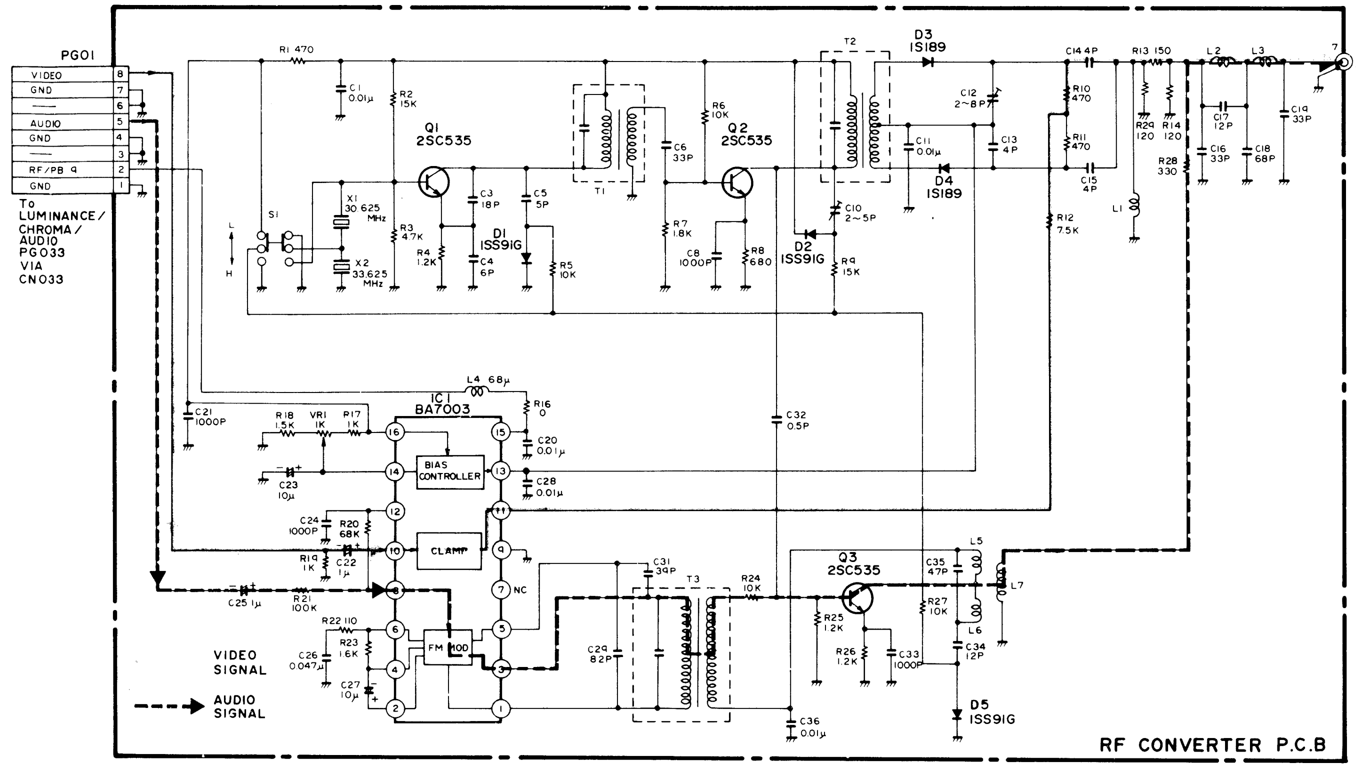
Q853

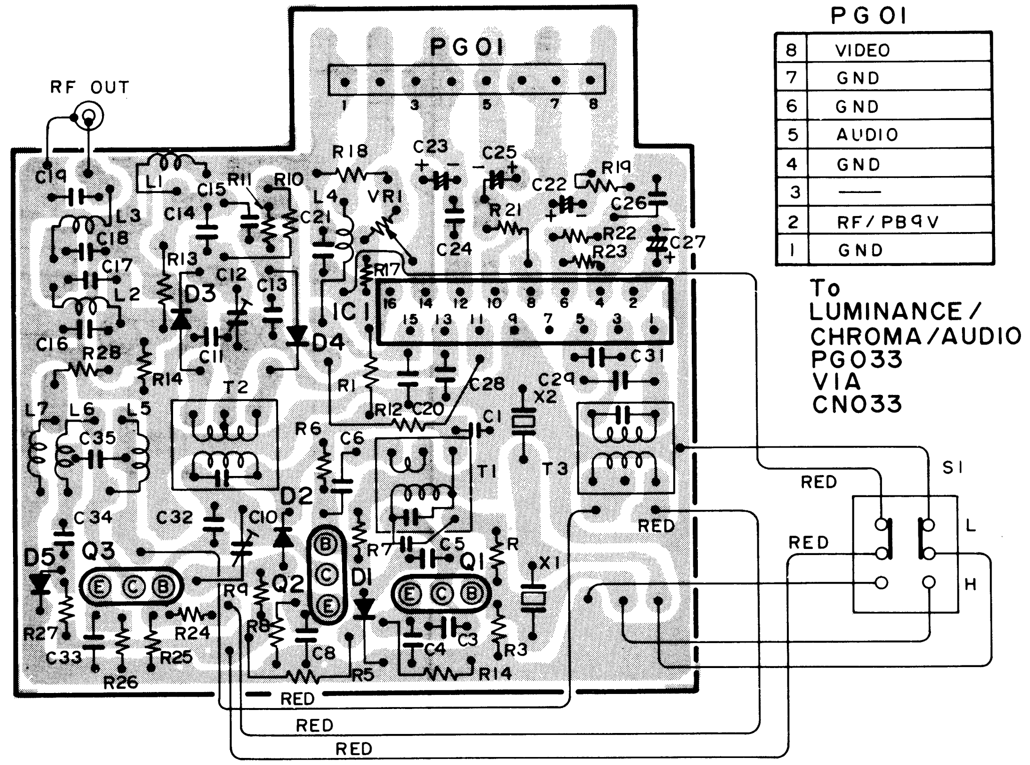
B	2.9
C	8.9
E	2.3


UHF ANT. (300Ω)
VHF ANT. (75Ω)
Q101 3SK82
Q102 2SC1070
Q103 2SC1070
Q141 3SK82
Q142 2SC1070
Q143 2SC1070
Q144 2SC1070
D101 ISV70
D102 ISV70
D103 ISV70
D104 ISV70
DZ101 HZ4
D141 ISV69
D142 ISV69
D143 ISV69
D144 ISV69
D151 ISS85
D152 ISS85
D153 ISS85
D154 ISS85
D155 ISS85
D156 ISS85
D161 IS2076
F141
BL
BH
BU
AGC
VT-V
VT-U
BM
IF OUT
TP
TUNER P.C.B
To IF P.C.B


UHF ANT.
VHF ANT.
Q101
Q102
Q103
Q141
Q142
Q143
Q144
ZD101
D151
D161
BL
BH
BU
AGC
VT-V
VT-U
BM
IF OUT
TUNER P.C.B
To IF P.C.B

RF CONVERTER


PG01
VIDEO
GND
AUDIO
GND
RF/PB 9
GND
To LUMINANCE/ CHROMA/ AUDIO PG033 VIA CN033
S1
L
H
X1 30.625 MHz
X2 33.625 MHz
Q1 2SC535
Q2 2SC535
Q3 2SC535
IC1 BA7003
BIAS CONTROLLER
CLAMP
FM MOD
D1 ISS91G
D2 ISS91G
D3 IS189
D4 IS189
D5 ISS91G
T1
T2
T3
RF OUT
VIDEO SIGNAL
AUDIO SIGNAL
RF CONVERTER P.C.B

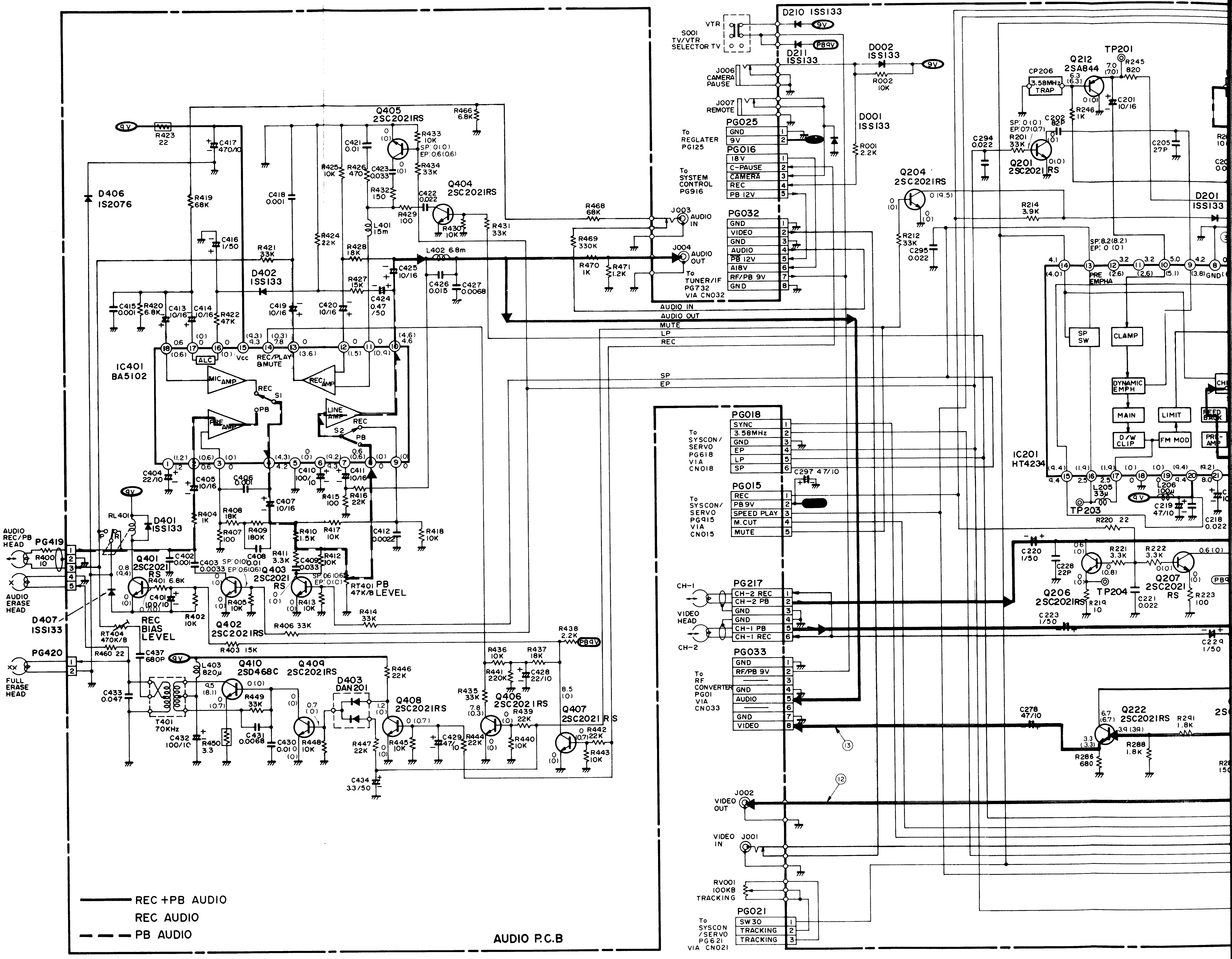

PG01
RF OUT
IC1
Q1
Q2
Q3
T1
T2
T3
X1
X2
VR1
S1
L
H
RED
RED
RED
RED
RED
To LUMINANCE/ CHROMA/AUDIO PG033 VIA CN033

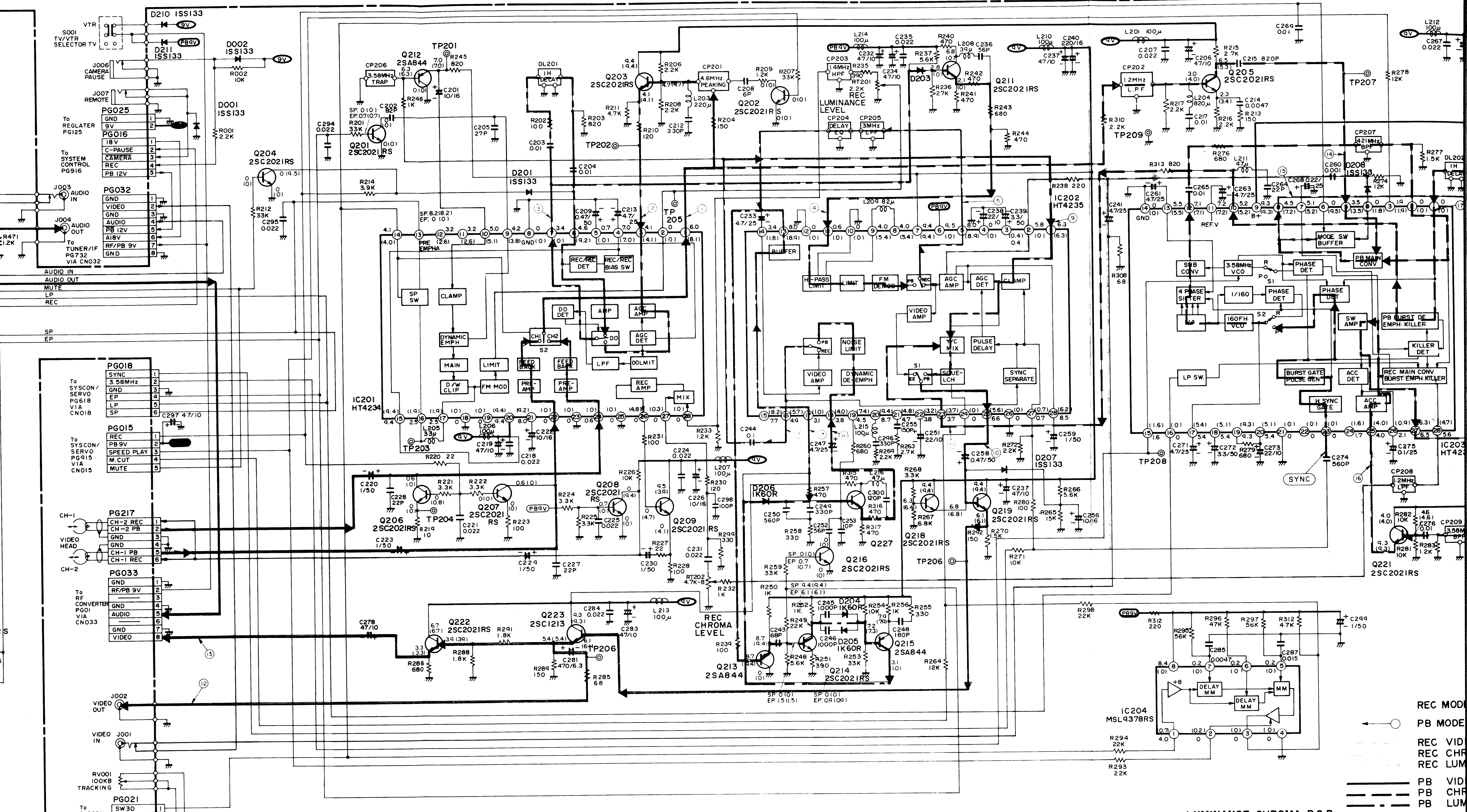
PG01

8	VIDEO
7	GND
6	GND
5	AUDIO
4	GND
3	——
2	RF/PB9V
1	GND

RF CONVERTER P.C.B

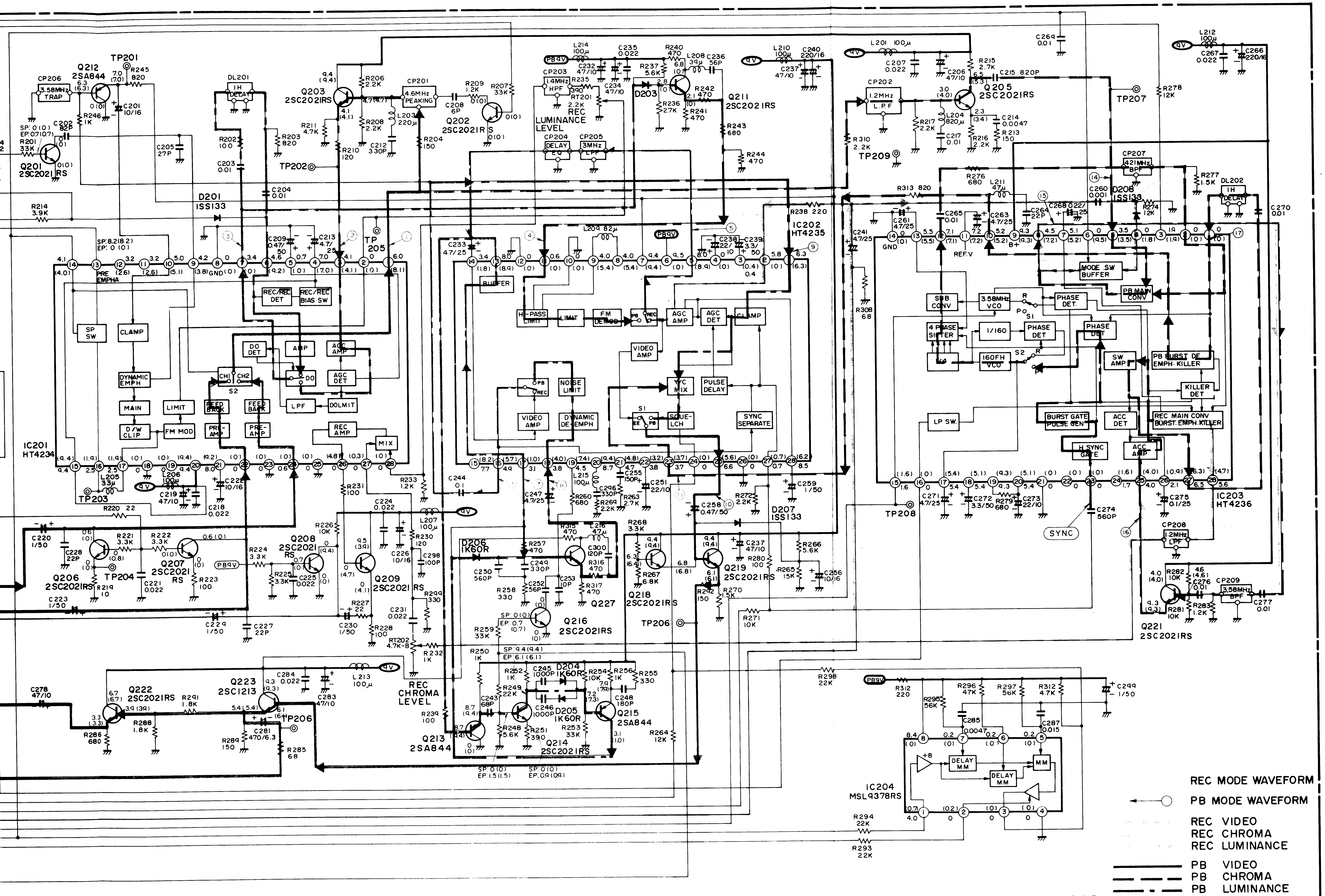
LUMINANCE/CHROMA/AUDIO


AUDIO P.C.B
REC +PB AUDIO
REC AUDIO
PB AUDIO
IC401
BA5102
MIC AMP
REC AMP
PRE AMP
LINE AMP
ALC
REC/PLAY & MUTE
Vcc
S1
S2
REC
PB
Q405 2SC2021RS
Q404 2SC2021RS
Q401 2SC2021 RS
Q402 2SC2021RS
Q403 2SC2021 RS
Q410 2SD468C
Q409 2SC2021RS
Q408 2SC2021RS
Q406 2SC2021RS
Q407 2SC2021RS
D406 1S2076
D402 1SS133
D401 1SS133
D407 1SS133
D403 DAN201
RL401
T401 70KHz
RT401 PB 47K/B LEVEL
RT404 470K/B REC BIAS LEVEL
L401 15m
L402 6.8m
L403 820μ
AUDIO REC/PB HEAD
PG419
AUDIO ERASE HEAD
PG420
FULL ERASE HEAD
9V
PB9V
J003 AUDIO IN
J004 AUDIO OUT
To TUNER/IF PG732 VIA CN032
AUDIO IN
AUDIO OUT
MUTE
LP
REC
SP
EP
S001 TV/VTR SELECTOR
VTR
TV
J006 CAMERA PAUSE
J007 REMOTE
D210 1SS133
D211 1SS133
D002 1SS133
D001 1SS133
R002 10K
R001 2.2K
PG025
GND
9V
To REGLATER PG125
PG016
18V
C-PAUSE
CAMERA
REC
PB 12V
To SYSTEM CONTROL PG916
PG032
GND
VIDEO
GND
AUDIO
PB 12V
A18V
RF/PB 9V
GND
PG018
SYNC
3.58MHz
GND
EP
LP
SP
To SYSCON/SERVO PG618 VIA CN018
PG015
REC
PB9V
SPEED PLAY
M.CUT
MUTE
To SYSCON/SERVO PG915 VIA CN015
PG217
CH-2 REC
CH-2 PB
GND
GND
CH-1 PB
CH-1 REC
CH-1
CH-2
VIDEO HEAD
PG033
GND
RF/PB 9V
GND
AUDIO
GND
VIDEO
To RF CONVERTER PG01 VIA CN033
J002 VIDEO OUT
J001 VIDEO IN
RV001 100KB TRACKING
PG021
SW30
TRACKING
TRACKING
To SYSCON/SERVO PG621 VIA CN021
⑫
⑬
Q212 2SA844
TP201
CP206 3.58MHz TRAP
Q201 2SC2021RS
Q204 2SC2021RS
D201 1SS133
IC201 HT4234
PRE EMPHA
SP SW
CLAMP
DYNAMIC EMPH
MAIN
LIMIT
D/W CLIP
FM MOD
TP203
TP204
Q206 2SC2021RS
Q207 2SC2021 RS
Q222 2SC2021RS


S001 TV/VTR SELECTOR
D210 ISS133
D211 ISS133
D002 ISS133
D001 ISS133
J006 CAMERA PAUSE
J007 REMOTE
PG025
PG016
PG032
PG018
PG015
PG217
PG033
PG021
J003 AUDIO IN
J004 AUDIO OUT
J002 VIDEO OUT
J001 VIDEO IN
RV001 100KB TRACKING
VIDEO HEAD
CH-1
CH-2
Q201 2SC2021RS
Q202 2SC2021RS
Q203 2SC2021RS
Q204 2SC2021RS
Q205 2SC2021RS
Q206 2SC2021RS
Q207 2SC2021RS
Q208 2SC2021RS
Q209 2SC2021RS
Q211 2SC2021RS
Q212 2SA844
Q213 2SA844
Q214 2SC2021RS
Q215 2SA844
Q216 2SC2021RS
Q218 2SC2021RS
Q219 2SC2021RS
Q221 2SC2021RS
Q222 2SC2021RS
Q223 2SC1213
Q227
IC201 HT4234
IC202 HT4235
IC204 MSL9378RS
D201 ISS133
D203
D204 1K60R
D205 1K60R
D206 1K60R
D207 ISS133
D208 ISS133
DL201 1H DELAY
CP201 4.6MHz PEAKING
CP202 1.2MHz L.P.F
CP203 1.4MHz HPF
CP204 DELAY EQ
CP205 3MHz LPF
CP206 3.58MHz TRAP
CP207 4.21MHz BPF
CP208 1.2MHz LPF
TP201
TP202
TP203
TP204
TP205
TP206
TP207
TP208
TP209
LUMINANCE LEVEL
REC CHROMA LEVEL
SYNC
REC MODE
PB MODE
REC VID
REC CHR
REC LUM
PB VID
PB CHR
PB LUM

LUMINANCE·CHROMA P.C.B

X VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

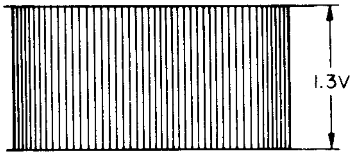
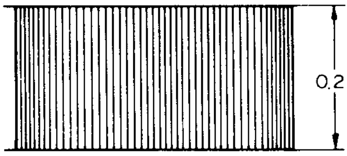
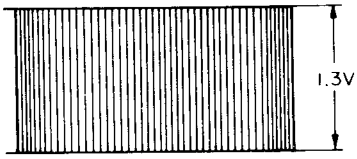
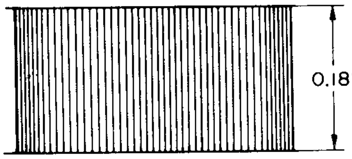
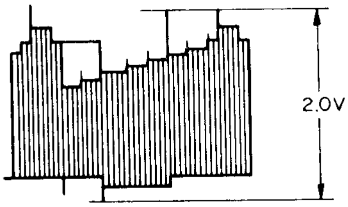
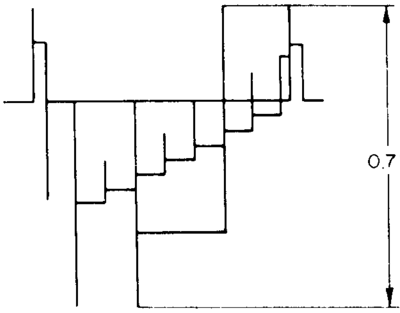
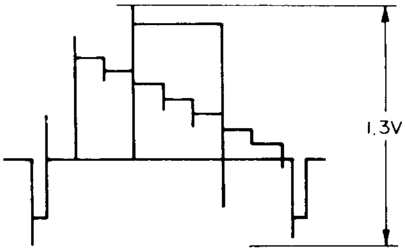
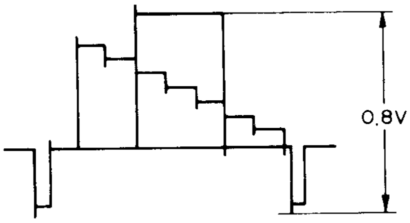
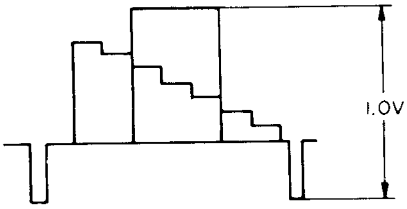

IC201
HT4234
IC202
HT4235
IC203
HT4236
IC204
MSL9378RS
Q201
2SC2021RS
Q202
2SC2021RS
Q203
2SC2021RS
Q205
2SC2021RS
Q206
2SC2021RS
Q207
2SC2021RS
Q208
2SC2021RS
Q209
2SC2021RS
Q211
2SC2021RS
Q212
2SA844
Q213
2SA844
Q214
2SC2021RS
Q215
2SA844
Q216
2SC2021RS
Q218
2SC2021RS
Q219
2SC2021RS
Q221
2SC2021RS
Q222
2SC2021RS
Q223
2SC1213
Q227
D201
1SS133
D203
D204
1K60R
D205
1K60R
D206
1K60R
D207
1SS133
D208
1SS133
DL201
1H DELAY
DL202
1H DELAY
CP201
4.6MHz PEAKING
CP202
1.2MHz L.P.F
CP203
1.4MHz HPF
CP204
DELAY EQ
CP205
3MHz LPF
CP206
3.58MHz TRAP
CP207
4.21MHz BPF
CP208
1.2MHz LPF
CP209
3.58MHz BPF
TP201
TP202
TP203
TP204
TP205
TP206
TP207
TP208
TP209
RT201
LUMINANCE REC LEVEL
RT202
REC CHROMA LEVEL
PB9V
9V
SYNC
PRE EMPHA
SP SW
CLAMP
DYNAMIC EMPH
MAIN
LIMIT
D/W CLIP
FM MOD
FEED BACK
PRE-AMP
CH1
CH2
S2
REC/REC DET
REC/REC BIAS SW
DO DET
AMP
AGC AMP
AGC DET
DO
LPF
DOLMIT
REC AMP
MIX
BUFFER
H-PASS LIMIT
LIMIT
FM DEMOD
PB
REC
AGC AMP
AGC DET
CLAMP
VIDEO AMP
Y/C MIX
PULSE DELAY
NOISE LIMIT
DYNAMIC DE-EMPH
SQUELCH
SYNC SEPARATE
S1
EE
MODE SW BUFFER
PB MAIN CONV
SUB CONV
3.58MHz VCO
PHASE DET
4 PHASE SHIFTER
1/160
160FH VCO
SW AMP
PB BURST DE EMPH·KILLER
KILLER DET
LP SW
BURST GATE PULSE GEN
ACC DET
REC MAIN CONV BURST EMPH.KILLER
H SYNC GATE
ACC AMP
REF.V
GND
+B
DELAY MM
MM
REC MODE WAVEFORM
PB MODE WAVEFORM
REC VIDEO
REC CHROMA
REC LUMINANCE
PB VIDEO
PB CHROMA
PB LUMINANCE

LUMINANCE·CHROMA P.C.B

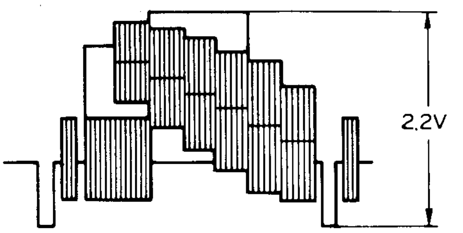
X VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

Y·chroma circuit waveform diagram

The diagram below shows the waveforms measured in the order of the route of the signal obtained when the color bar signal recorded on the alignment tape is played back. The FM signal is measured at the TV-V (1ms/div) position and the other signals, at the TV-H (20μs/div) position.

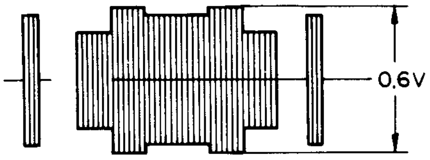
1	 IC201-① (PLAY)
2	 IC201-③ (PLAY)
3	 IC201-⑦ (PLAY)
4	 IC202-⑪ (PLAY)
5	 IC202-⑤ (PLAY)
6	 IC202-⑬ (PLAY)
7	 IC202-⑰ (PLAY)
8	 IC202-⑱ (PLAY)
9	 IC202-⑯ IC202-① (PLAY)

10



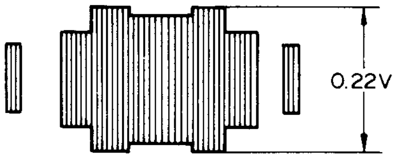
IC202-㉕ (PLAY)

14



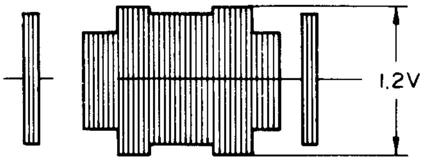
IC203-⑤ (PLAY)

11



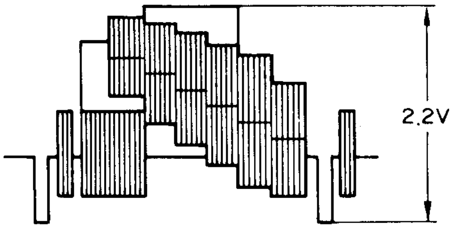
IC202-㉓ (PLAY)

15



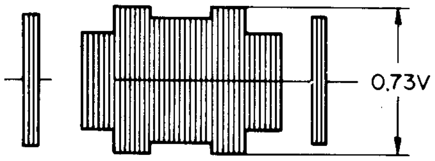
IC203-⑧ (PLAY)

12



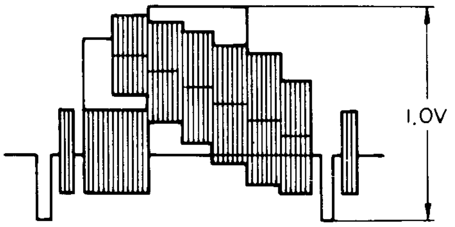
VIDEO OUT (PLAY)

16



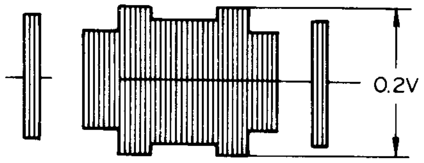
IC203-㉕ (PLAY)

13



RF VIDEO OUT
(PGO 33-⑧) (PLAY)

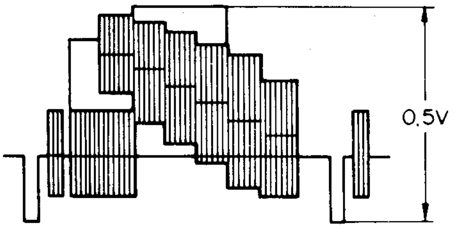
17



IC203-① (PLAY)

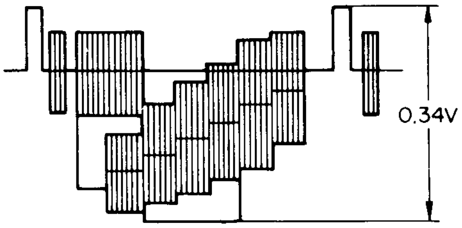
The diagram below shows the waveforms measured in the order of the route of the signal obtained when the color bar signal (0.5Vp-p) is input to the video input jack and recorded in the EP mode. The FM signal is measured at the TV-V (1ms/div) position, and the other signals, at the TV-H (20μs/div) position.

20

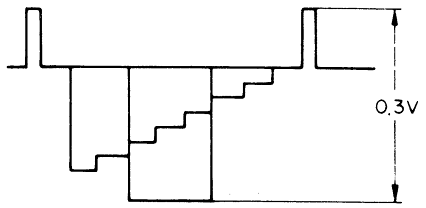
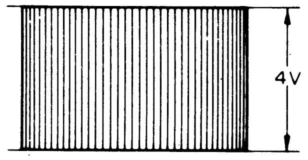
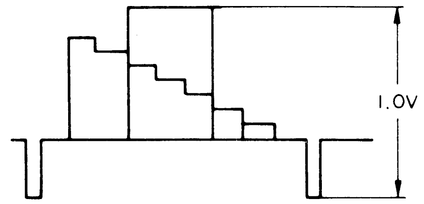
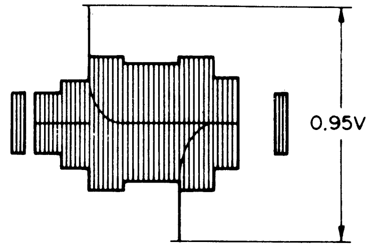
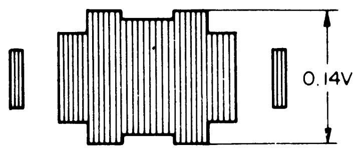
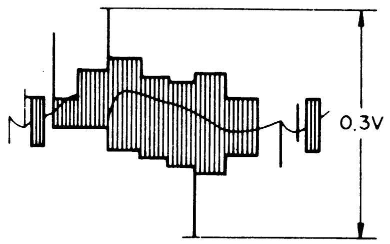
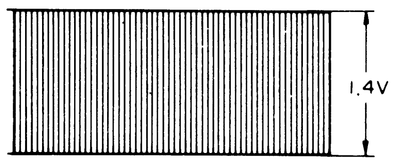
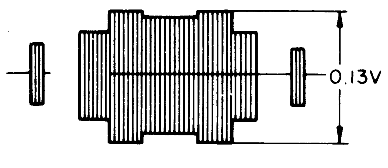
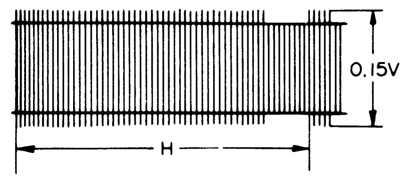
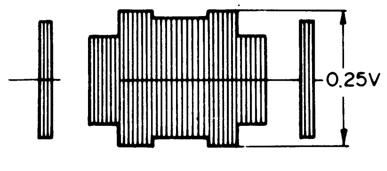


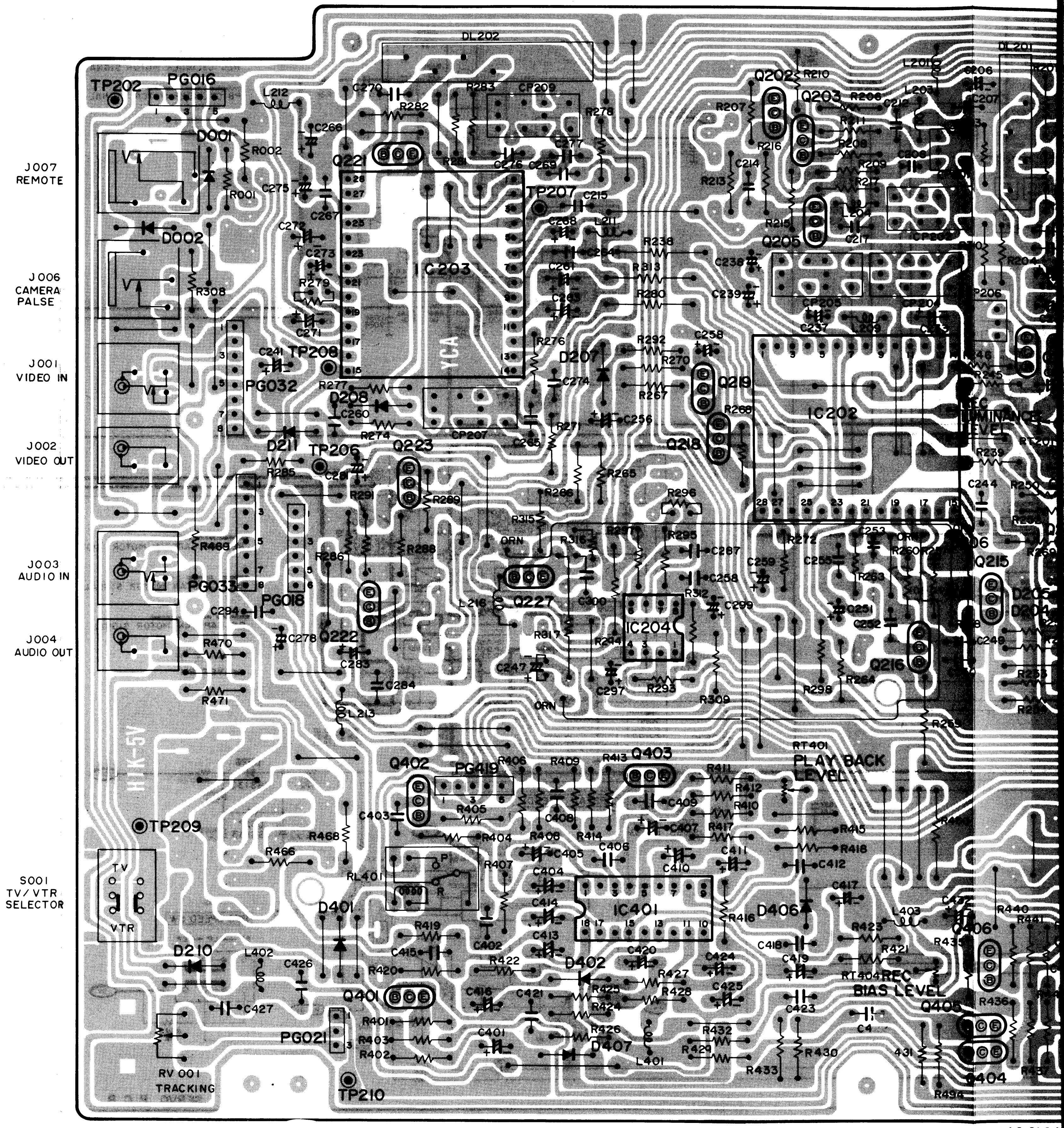
VIDEO INPUT
IC202-② (REC)

21

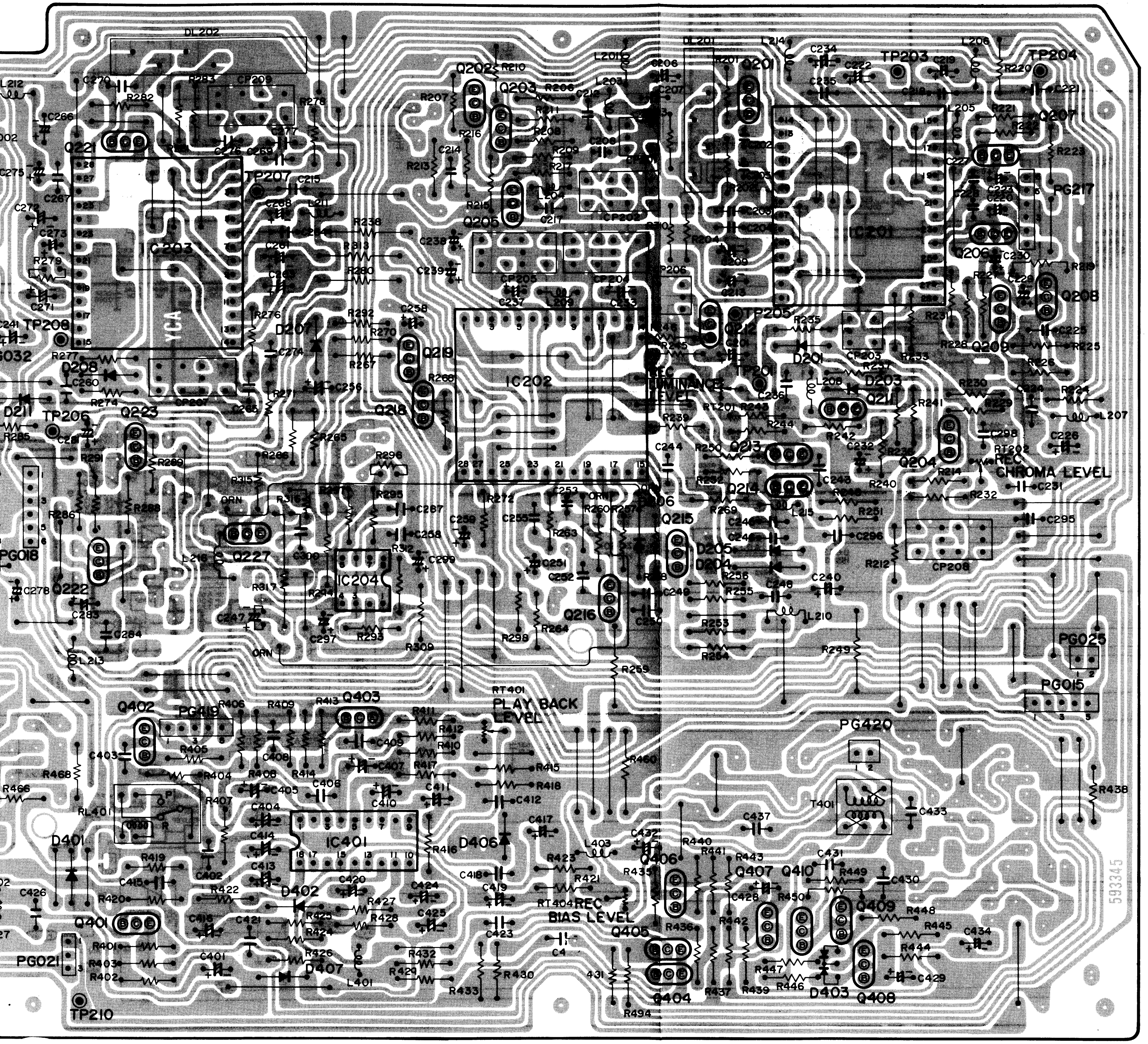


IC202-⑤ (REC)

22	 IC202-⑭ (REC)	27	 IC201-㉖ (REC)
23	 IC201-⑩ IC202-⑯ (REC)	28	 IC203-④ (REC)
24	 IC203-⑩ (REC)	29	 IC203-⑧ (REC)
25	 IC201-② TP205(REC)	30	 IC203-㉕ (REC)
26	 IC201-㉘ (REC)	31	 IC203-㉘ IC201-㉗ (REC)


J007
REMOTE
J006
CAMERA
PALSE
J001
VIDEO IN
J002
VIDEO OUT
J003
AUDIO IN
J004
AUDIO OUT
S001
TV/VTR
SELECTOR
TV
VTR
RV001
TRACKING
TP202
PG016
D001
D002
R308
TP208
PG032
PG033
PG018
TP206
TP209
TP210
PG021
D210
Q221
IC203
YCA
TP207
DL202
Q202
Q203
Q205
Q219
Q218
Q223
Q227
Q222
IC204
IC202
LUMINANCE
LEVEL
Q215
Q216
RT401
PLAY BACK
LEVEL
Q402
PG419
Q403
IC401
RL401
D401
D402
D406
D407
Q401
Q406
RT404 REC
BIAS LEVEL
Q405
Q404

LUMIN


DL202
DL201
IC203
VCA
IC202
IC201
IC204
IC401
TP203
TP204
TP205
TP206
TP207
TP208
TP210
PG217
PG018
PG021
PG025
PG015
PG419
PG420
T401
RL401
REC LUMINANCE LEVEL
REC CHROMA LEVEL
RT401 PLAY BACK LEVEL
RT404 REC BIAS LEVEL
593345

LUMINANCE/CHROMA AUDIO P.C.B

PG015

1	REC
2	PB 9V
3	SPEED PLAY
4	M. CUT
5	MUTE

To
SYSCON/SERVO
PG915
VIA
CN015

PG016

1	18V
2	C - PAUSE
3	CAMERA
4	REC
5	PB 12V

To
SYSTEM
CONTROL
PG916

PG018

1	SYNC
2	3.58 MHz
3	GND
4	EP
5	LP
6	SP

To
SYSCON/SERVO
PG618
VIA
CN018

PG021

1	SW 30
2	TRACKING
3	TRACKING

To
SYSCON/SERVO
PG621
VIA
CN021

PG025

1	GND
2	9V

To
SERVO
PG634

PG032

1	GND
2	VIDEO
3	GND
4	AUDIO
5	PB 12V
6	18V
7	RF/PB 9V
8	GND

To
TUNER/IF
PG732
VIA
CN032

PG033

1	GND
2	RF/PB 9V
3	———
4	GND
5	AUDIO
6	———
7	GND
8	VIDEO

To
RF CONVERTER
PG01
VIA
CN033

PG217

6	CH-1 REC
5	CH-1 PB
4	GND
3	GND
2	CH-2 PB
1	CH-2 REC

To
VIDEO HEAD

PG419

1	PLAY
2	GND
3	RECORD
4	GND
5	AUDIO ERASE

To
AUDIO REC/PB,
ERASE HEAD

PG420

1	FULL ERASE
2	GND

To
FULL ERASE
HEAD

Q201

B	SP: 0 (0) EP: 0.7(0.7)
C	0 (0)
E	0 (0)

Q202

		SEARCH
B	0 (0)	0.7
C	0 (0)	0
E	0 (0)	0

Q2

B	
C	
E	

Q206

B	0 (0.8)
C	0.6 (0)
E	0 (0)

Q207

B	0 (0)
C	0.6 (0)
E	0 (0)

Q208

B	0.7 (0)
C	0 (9.4)
E	0 (0)

Q212

B	6.3(6.3)
C	0 (0)
E	7.0(7.0)

Q213

B	8.0(8.9)
C	0 (0)
E	8.7(9.4)

Q214

B	SP: 0(0) EP: 1.5(1.5)
C	SP: 9.4(9.4) EP: 6.1(6.1)
E	SP: 0 (0) EP: 0.9(0.9)

Q218

B	6.3(6.4)
C	9.4 (9.4)
E	6.8 (6.8)

Q219

B	6.8 (6.8)
C	9.4(9.4)
E	6.1(6.1)

Q221

B	4.6(4.6)
C	9.3(9.3)
E	4.0(4.0)

Q401

B	0.7 (0)
C	0.8 (9.4)
E	0 (0)

Q402

B	SP: 0 (0) EP: 0.6(0.6)
C	0 (0)
E	0 (0)

Q403

B	SP: 0.6(0.7) EP: 0 (0)
C	0 (0)
E	0 (0)

Q407

B	0 (0.7)
C	8.5(0)
E	0 (0)

Q408

B	0 (0.7)
C	1.2 (0)
E	0 (0)

Q409

B	0.7 (0)
C	0 (0)
E	0 (0)

IC201

14	4.1 (4.0)	15	9.4 (9.4)
13	SP: 8.2 (8.2) EP: 0 (0)	16	2.5 (1.9)
12	3.2 (2.6)	17	2.5(1.9)
11	3.2 (2.6)	18	0 (0)
10	5.0(5.1)	19	0 (0)
9	4.2 (3.8)	20	9.4(9.4)
8	0 (0)	21	8.0 (9.2)
7	3.4 (0)	22	0 (0)
6	4.6 (9.2)	23	0 (0)
5	0.7 (0)	24	0.6 (0)
4	7.0 (7.0)	25	0 (0)
3	4.1 (4.1)	26	0 (4.8)
2	0 (0)	27	0 (0.3)
1	6.0(8.1)	28	0 (0)

IC203

28	5.6 (4.7)	1	0 (
27	6.5 (6.3)	2	0 (
26	2.1 (0.9)	3	1.9 (1.
25	4.0 (4.0)	4	0 (1.
24	1.7 (1.6)	5	3.5(3
23	0 (0)	6	0 (9
22	0 (0)	7	5.1(5
21	0 (0)	8	4.5(7
20	5.4 (5.1)	9	9.3(9
19	9.3(9.3)	10	5.2(5
18	5.4 (5.1)	11	7.2(7
17	5.4(5.4)	12	7.1 (7
16	0 (0)	13	5.5(5
15	1.6 (1.6)	14	0 (

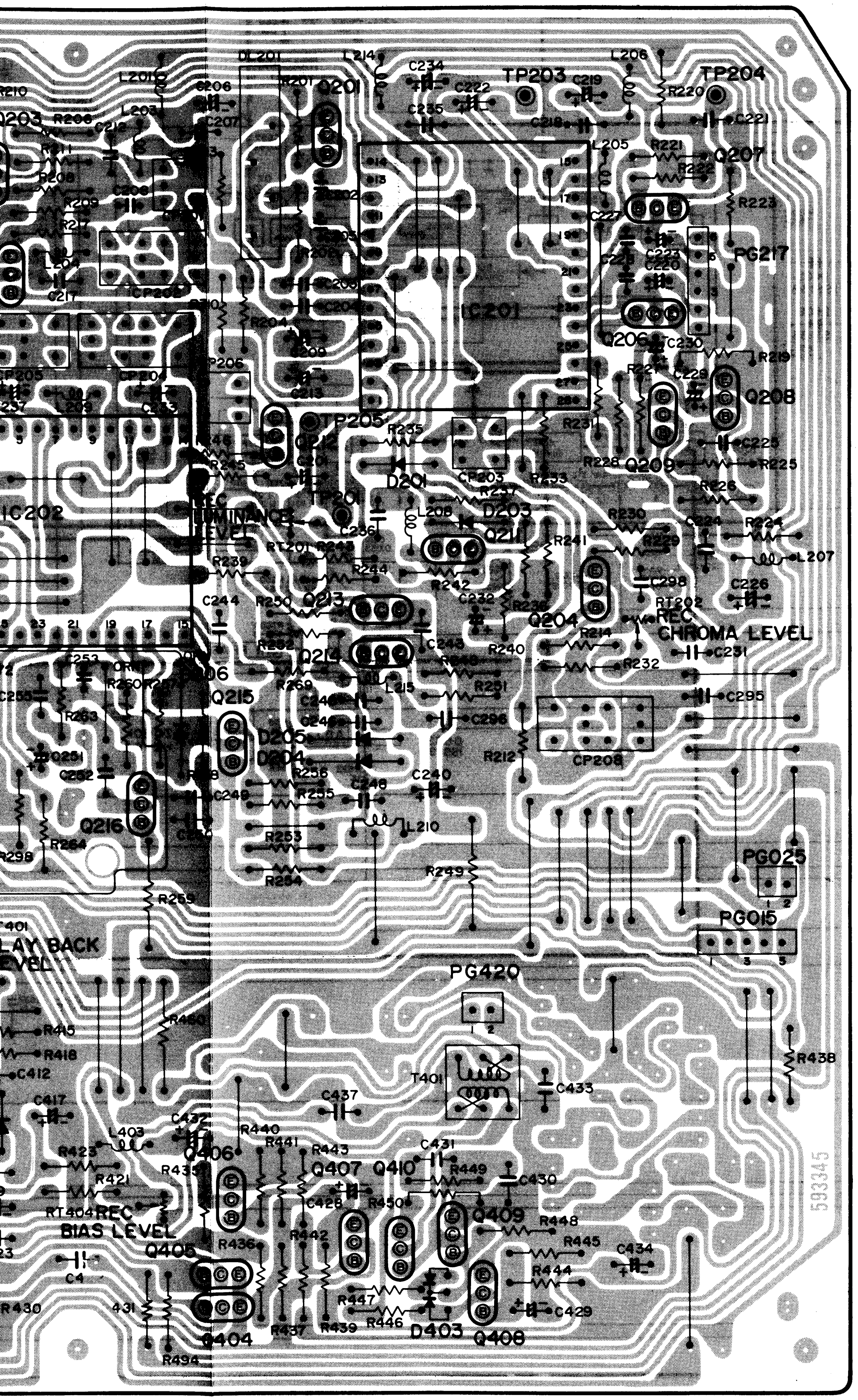
IC401

1	2	3	4	5	6
1.2(1.2)	0.6(0.6)	0 (0)	4.2(4.3)	0 (0)	9.3(9.2)
18	17	16	15	14	13
0.6(0.6)	0 (0)	0 (0)	9.3(9.3)	7.8(0.3)	0(3.6)

IC202

1	2	3	4	5	6	7	8	9
6.3(6.3)	5.8 (0)	0.4(0.4)	0 (1.5)	8.0(8.9)	9.5 (0)	9.4(9.4)	4.0(5.4)	4.0(5
28	27	26	25	24	23	22	21	20
8.5(6.2)	0.7(0.7)	0 (0)	6.6(5.6)	0 (0)	3.7(3.7)	3.8(3.2)	4.7(4.8)	8.7(9

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) A


DL201
L201
R201
Q201
L214
C234
C235
C222
TP203
C219
L206
TP204
R220
C221
R203
R206
C216
L203
C207
C206
R210
R211
R208
R209
R217
L205
R221
R222
Q207
R223
C227
C224
C223
C220
PG217
IC201
R204
Q206
C230
R219
Q208
C225
R225
TP205
R235
Q209
R228
R231
R226
R233
D201
D203
R237
Q211
R241
R230
R229
R224
L207
C226
C298
RT202
REC CHROMA LEVEL
Q204
R214
C231
R232
C295
R240
R231
C290
CP208
R212
IC202
REC LUMINANCE LEVEL
RT201
R243
R244
R242
C232
R250
Q213
Q214
C244
R239
R252
R269
L215
C248
C240
C246
Q215
D205
D204
R258
R255
R253
R254
L210
R249
R268
C249
Q216
C252
R264
C251
R298
PG025
PG015
PLAY BACK LEVEL
PG420
R438
T401
C433
C437
R45
R418
C412
C417
L403
C432
R440
R441
R443
Q406
R435
R423
R421
Q407
Q410
C431
R449
C430
C428
R450
Q409
R448
R445
C434
R444
C429
RT404
REC BIAS LEVEL
Q405
R436
R442
R447
R446
D403
Q408
R430
C4
431
Q404
R437
R439
R494
593345

LUMINANCE/CHROMA AUDIO P.C.B

PG015

1	REC
2	PB 9V
3	SPEED PLAY
4	M. CUT
5	MUTE

To
SYSCON/SERVO
PG915
VIA
CN015

PG016

1	18V
2	C - PAUSE
3	CAMERA
4	REC
5	PB 12V

To
SYSTEM
CONTROL
PG916

PG018

1	SYNC
2	3.58 MHz
3	GND
4	EP
5	LP
6	SP

To
SYSCON/SERVO
PG618
VIA
CN018

PG021

1	SW 30
2	TRACKING
3	TRACKING

To
SYSCON/SERVO
PG621
VIA
CN021

PG025

1	GND
2	9V

To
SERVO
PG634

PG032

1	GND
2	VIDEO
3	GND
4	AUDIO
5	PB 12V
6	18V
7	RF/PB 9V
8	GND

To
TUNER/IF
PG732
VIA
CN032

PG033

1	GND
2	RF/PB 9V
3	———
4	GND
5	AUDIO
6	———
7	GND
8	VIDEO

To
RF CONVERTER
PG01
VIA
CN033

PG217

6	CH-1 REC
5	CH-1 PB
4	GND
3	GND
2	CH-2 PB
1	CH-2 REC

To
VIDEO HEAD

PG419

1	PLAY
2	GND
3	RECORD
4	GND
5	AUDIO ERASE

To
AUDIO REC/PB,
ERASE HEAD

PG420

1	FULL ERASE
2	GND

To
FULL ERASE
HEAD

Q201

B	SP: 0 (0) EP: 0.7 (0.7)
C	0 (0)
E	0 (0)

Q202

		SEARCH
B	0 (0)	0.7
C	0 (0)	0
E	0 (0)	0

Q203

B	4.7 (4.7)
C	9.4 (9.4)
E	4.1 (4.1)

Q204

B	0 (0)
C	0 (9.5)
E	0 (0)

Q205

B	3.0 (4.0)
C	6.5 (5.3)
E	2.3 (3.4)

Q206

B	0 (0.8)
C	0.6 (0)
E	0 (0)

Q207

B	0 (0)
C	0.6 (0)
E	0 (0)

Q208

B	0.7 (0)
C	0 (9.4)
E	0 (0)

Q209

B	0 (4.7)
C	9.5 (3.9)
E	0 (4.1)

Q211

B	2.8 (0)
C	6.8 (0)
E	2.1 (0)

Q212

B	6.3 (6.3)
C	0 (0)
E	7.0 (7.0)

Q213

B	8.0 (8.9)
C	0 (0)
E	8.7 (9.4)

Q214

B	SP: 0 (0) EP: 1.5 (1.5)
C	SP: 9.4 (9.4) EP: 6.1 (6.1)
E	SP: 0 (0) EP: 0.9 (0.9)

Q215

B	7.2 (7.3)
C	3.1 (1.0)
E	7.9 (7.9)

Q216

B	SP: 0 (0) EP: 0.7 (0.7)
C	0 (0)
E	0 (0)

Q218

B	6.3 (6.4)
C	9.4 (9.4)
E	6.8 (6.8)

Q219

B	6.8 (6.8)
C	9.4 (9.4)
E	6.1 (6.1)

Q221

B	4.6 (4.6)
C	9.3 (9.3)
E	4.0 (4.0)

Q222

B	3.9 (3.9)
C	6.7 (6.7)
E	3.3 (3.3)

Q223

B	6.1 (6.1)
C	9.3 (9.3)
E	5.4 (5.4)

Q401

B	0.7 (0)
C	0.8 (9.4)
E	0 (0)

Q402

B	SP: 0 (0) EP: 0.6 (0.6)
C	0 (0)
E	0 (0)

Q403

B	SP: 0.6 (0.7) EP: 0 (0)
C	0 (0)
E	0 (0)

Q405

B	SP: 0 (0) EP: 0.6 (0.6)
C	0 (0)
E	0 (0)

Q406

B	0 (0)
C	7.8 (0.3)
E	0 (0)

Q407

B	0 (0.7)
C	8.5 (0)
E	0 (0)

Q408

B	0 (0.7)
C	1.2 (0)
E	0 (0)

Q409

B	0.7 (0)
C	0 (0)
E	0 (0)

Q410

B	0 (0)
C	9.5 (8.1)
E	0 (0.7)

IC201

14	4.1 (4.0)	15	9.4 (9.4)
13	SP: 8.2 (8.2) EP: 0 (0)	16	2.5 (1.9)
12	3.2 (2.6)	17	2.5 (1.9)
11	3.2 (2.6)	18	0 (0)
10	5.0 (5.1)	19	0 (0)
9	4.2 (3.8)	20	9.4 (9.4)
8	0 (0)	21	8.0 (9.2)
7	3.4 (0)	22	0 (0)
6	4.6 (9.2)	23	0 (0)
5	0.7 (0)	24	0.6 (0)
4	7.0 (7.0)	25	0 (0)
3	4.1 (4.1)	26	0 (4.8)
2	0 (0)	27	0 (0.3)
1	6.0 (8.1)	28	0 (0)

IC203

28	5.6 (4.7)	1	0 (0)
27	6.5 (6.3)	2	0 (0)
26	2.1 (0.9)	3	1.9 (1.9)
25	4.0 (4.0)	4	0 (1.8)
24	1.7 (1.6)	5	3.5 (3.5)
23	0 (0)	6	0 (9.5)
22	0 (0)	7	5.1 (5.2)
21	0 (0)	8	4.5 (7.2)
20	5.4 (5.1)	9	9.3 (9.3)
19	9.3 (9.3)	10	5.2 (5.2)
18	5.4 (5.1)	11	7.2 (7.2)
17	5.4 (5.4)	12	7.1 (7.1)
16	0 (0)	13	5.5 (5.5)
15	1.6 (1.6)	14	0 (0)

IC204

	5	6	7	8
	0.2 (0)	0.2 (0)	0.2 (0)	8.4 (0)
SEARCH	0.2	0.2	0.2	8.3
	4	3	2	1
	0 (0)	0 (0)	0 (0.2)	4.0 (0.7)
SEARCH	0	0	8.8	4.0

IC401

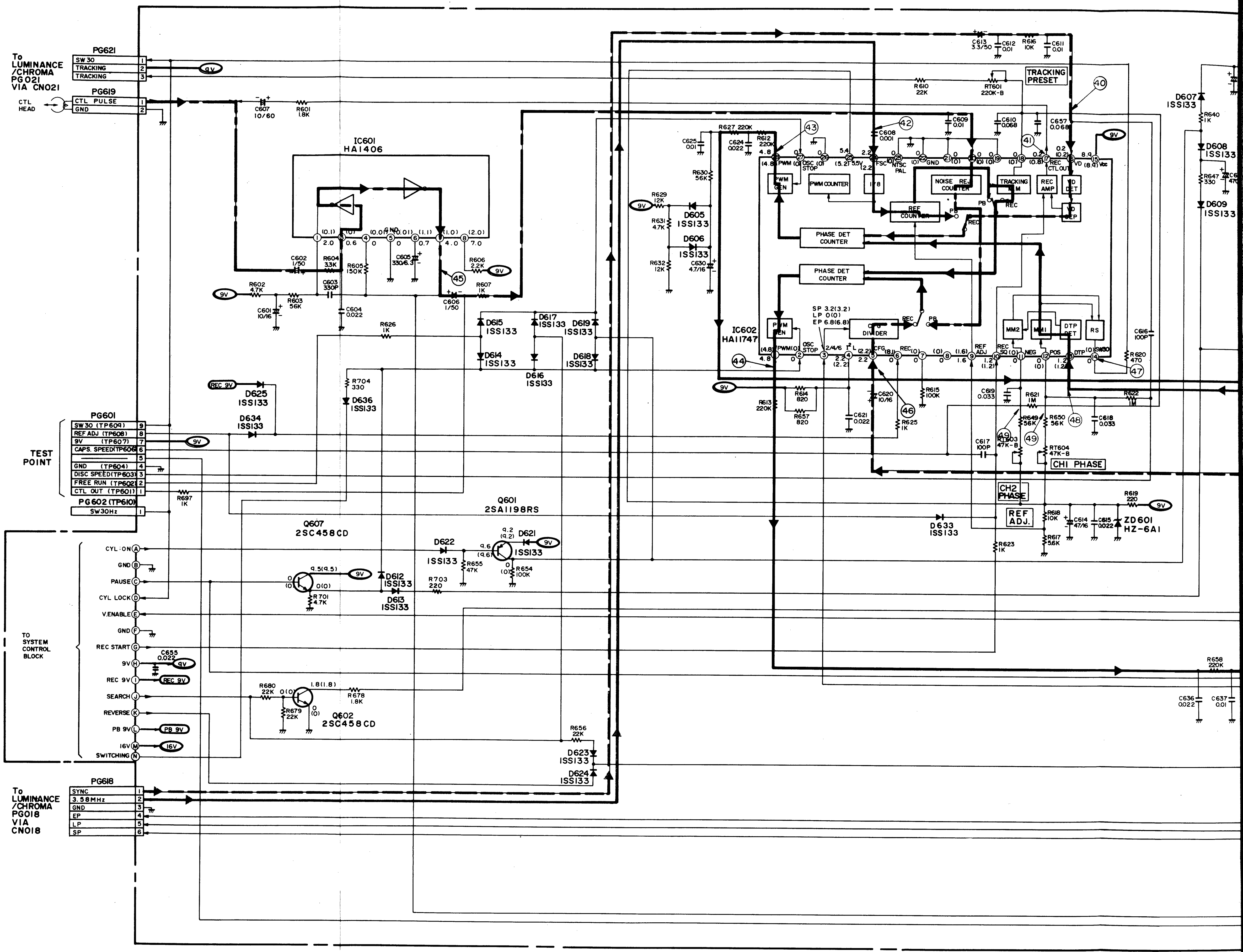
1	2	3	4	5	6	7	8	9
1.2 (1.2)	0.6 (0.6)	0 (0)	4.2 (4.3)	0 (0)	9.3 (9.2)	0.6 (0.6)	0 (0)	0 (0)
18	17	16	15	14	13	12	11	10
0.6 (0.6)	0 (0)	0 (0)	9.3 (9.3)	7.8 (0.3)	0 (3.6)	0 (1.5)	0 (0.9)	4.6 (4.6)

IC202

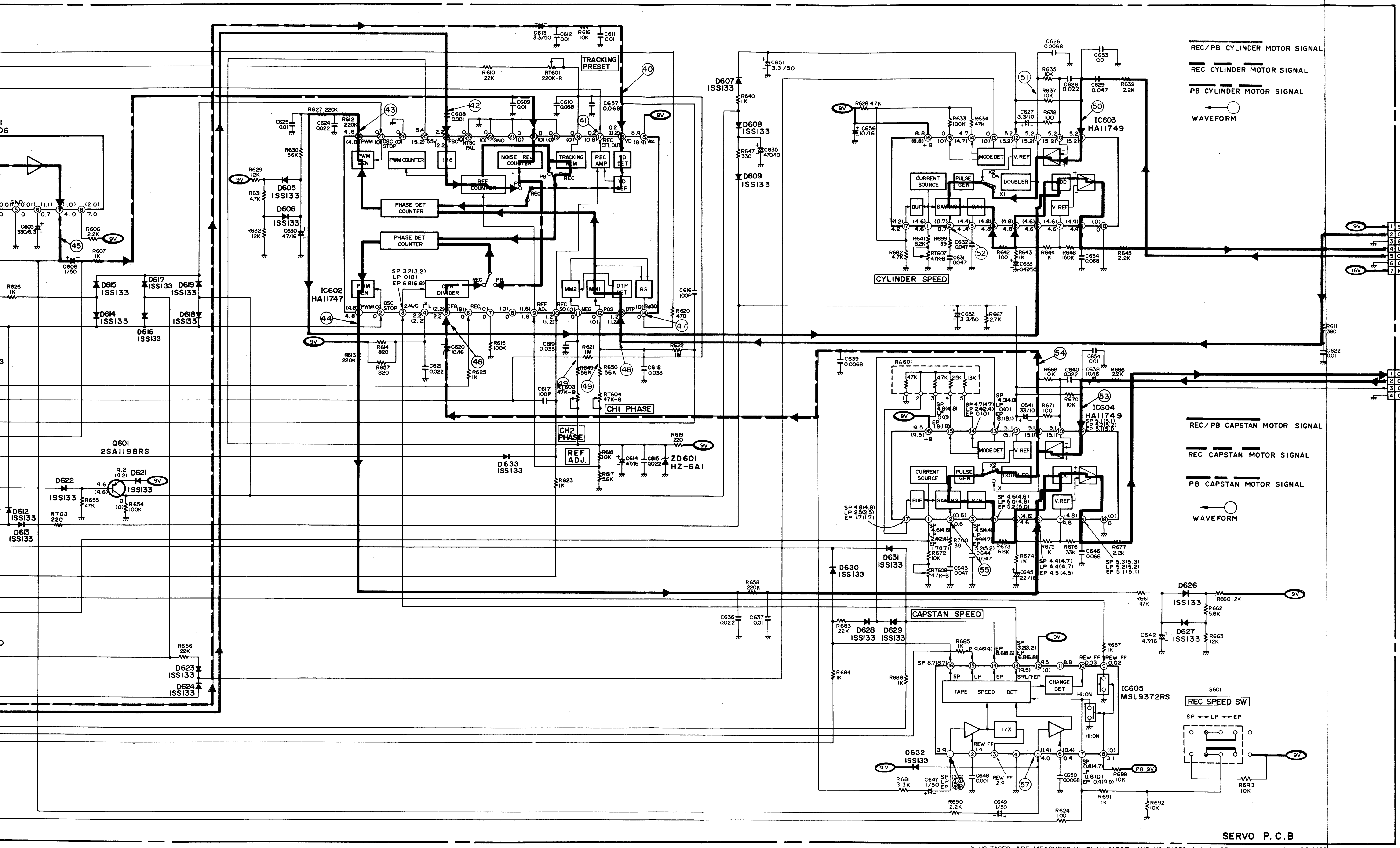
1	2	3	4	5	6	7	8	9	10	11	12	13	14
6.3 (6.3)	5.8 (0)	0.4 (0.4)	0 (1.5)	8.0 (8.9)	9.5 (0)	9.4 (9.4)	4.0 (5.4)	4.0 (5.4)	0 (0)	0.6 (0)	0 (0)	8.0 (8.9)	3.4 (1.8)
28	27	26	25	24	23	22	21	20	19	18	17	16	15
8.5 (6.2)	0.7 (0.7)	0 (0)	6.6 (5.6)	0 (0)	3.7 (3.7)	3.8 (3.2)	4.7 (4.8)	8.7 (9.4)	4.5 (7.4)	3.8 (4.0)	3.1 (1.0)	4.9 (5.7)	7.7 (8.2)

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

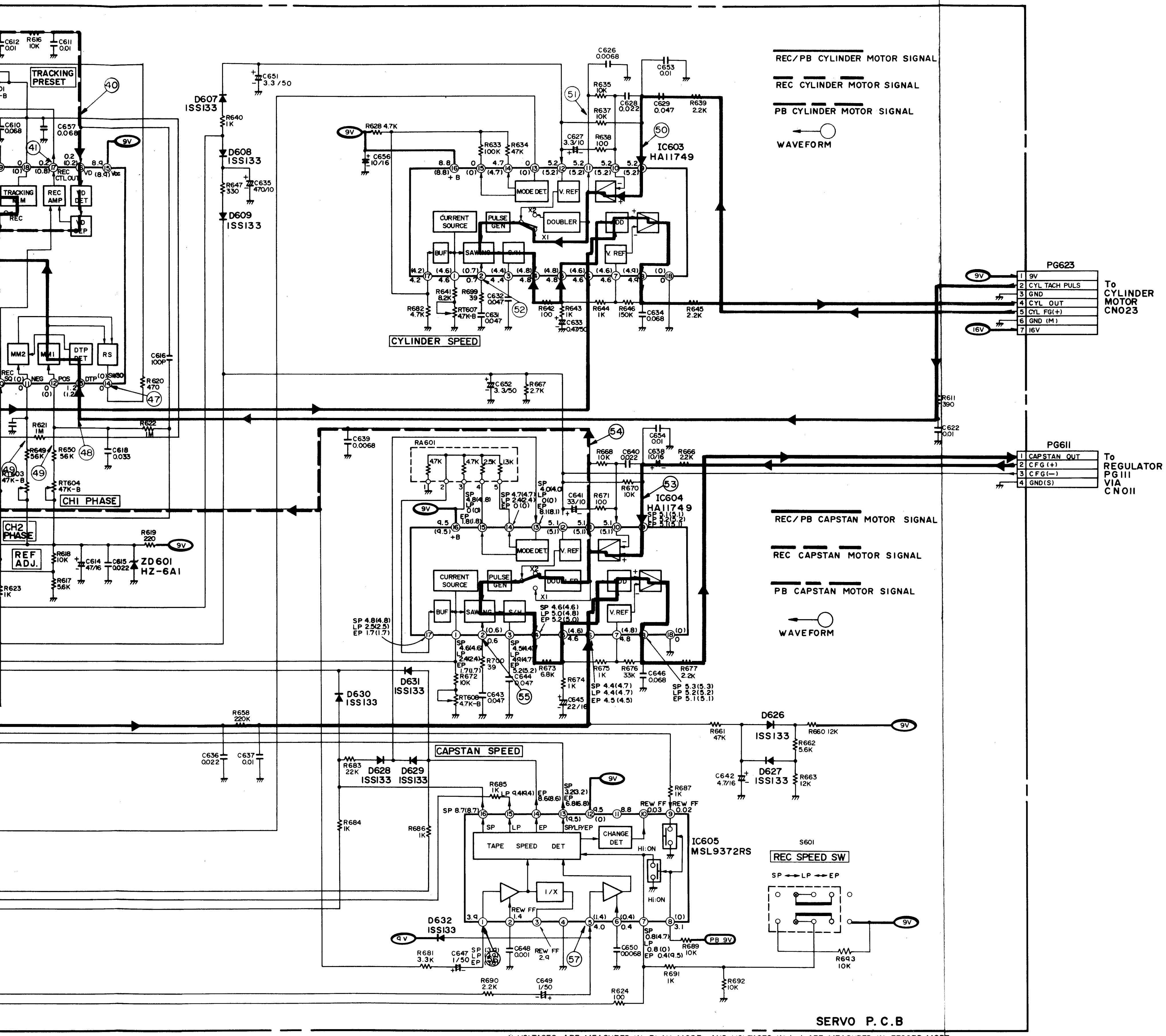
SERVO



To LUMINANCE /CHROMA PG021 VIA CN021
PG621
SW30
TRACKING
TRACKING
9V
PG619
CTL PULSE
GND
CTL HEAD
C607 10/60
R601 1.8K
IC601
HA1406
C602 1/50
R604 3.3K
R605 150K
C605 330/6.3
R606 2.2K
R607 1K
C606 1/50
R602 4.7K
C601 10/16
R603 56K
C603 330P
C604 0.022
R626 1K
D615 1SS133
D617 1SS133
D619 1SS133
D614 1SS133
D616 1SS133
D618 1SS133
REC 9V
D625 1SS133
R704 330
D636 1SS133
D634 1SS133
PG601
SW30 (TP609)
REF ADJ (TP608)
9V (TP607)
CAPS. SPEED (TP606)
GND (TP604)
DISC SPEED (TP603)
FREE RUN (TP602)
CTL OUT (TP601)
TEST POINT
PG602 (TP610)
SW30Hz
R697 1K
Q601
2SA1198RS
Q607
2SC458CD
D622 1SS133
D621 1SS133
R655 47K
R654 100K
D612 1SS133
D613 1SS133
R703 220
R701 4.7K
CYL ON
GND
PAUSE
CYL LOCK
V.ENABLE
GND
REC START
9V
REC 9V
SEARCH
REVERSE
PB 9V
16V
SWITCHING
TO SYSTEM CONTROL BLOCK
C655 0.022
R680 22K
R679 22K
R678 1.8K
Q602
2SC458CD
R656 22K
D623 1SS133
D624 1SS133
PG618
To LUMINANCE /CHROMA PG018 VIA CN018
SYNC
3.58MHz
GND
EP
LP
SP
IC602
HA11747
R627 220K
R612 220K
C625 0.01
C624 0.022
R630 56K
R629 12K
D605 1SS133
D606 1SS133
R631 4.7K
R632 12K
C630 4.7/16
C608 0.001
C609 0.01
C610 0.068
C657 0.068
C613 3.3/50
C612 0.01
R616 10K
C611 0.01
R610 22K
RT601 220K-B
TRACKING PRESET
PWM GEN
PWM COUNTER
1/8
NOISE REJ COUNTER
REF COUNTER
TRACKING MM
REC AMP
VD DET
VD SEP
PHASE DET COUNTER
PHASE DET COUNTER
PWM GEN
CFG DIVIDER
MM2
MM1
DTP DET
RS
SP 3.2(3.2)
LP 0(0)
EP 6.8(6.8)
OSC STOP
NTSC PAL
FSC
REC CTL OUT
VD
Vcc
PWM
REF ADJ
REC SQ
NEG
POS
DTP
SW30
R613 220K
R614 820
R657 820
C621 0.022
C620 10/16
R625 1K
R615 100K
C619 0.033
R621 1M
R649 56K
R650 56K
C618 0.033
R622 1M
C616 100P
R620 470
C617 100P
RT603 47K-B
RT604 47K-B
CH1 PHASE
CH2 PHASE
REF ADJ.
D633 1SS133
R618 10K
R617 5.6K
C614 47/16
C615 0.022
ZD601 HZ-6A1
R619 220
R623 1K
D607 1SS133
R640 1K
D608 1SS133
R647 330
D609 1SS133
R658 220K
C636 0.022
C637 0.01
40
41
42
43
44
45
46
47
48
49


REC/PB CYLINDER MOTOR SIGNAL
REC CYLINDER MOTOR SIGNAL
PB CYLINDER MOTOR SIGNAL
WAVEFORM
REC/PB CAPSTAN MOTOR SIGNAL
REC CAPSTAN MOTOR SIGNAL
PB CAPSTAN MOTOR SIGNAL
WAVEFORM
IC602 HA11747
IC603 HA11749
IC604 HA11749
IC605 MSL9372RS
Q601 2SA1198RS
ZD601 HZ-6A1
TRACKING PRESET
CYLINDER SPEED
CAPSTAN SPEED
CH1 PHASE
CH2 PHASE
REF ADJ.
PWM GEN
PWM COUNTER
1/8
NOISE REJ COUNTER
TRACKING MM
REC AMP
VD DET
VD SEP
REF COUNTER
PHASE DET COUNTER
CFG DIVIDER
MM2
MM1
DTP DET
RS
MODE DET
V. REF
CURRENT SOURCE
PULSE GEN
DOUBLER
BUF
SAWING
S/H
TAPE SPEED DET
CHANGE DET
1/X
SP
LP
EP
SP/LP/EP
REW FF
HI:ON
PG623
1 9V
2 CYL TACH PULS
3 GND
4 CYL OUT
5 CYL FG(+)
6 GND (M)
7 16V
To CYLIN MOTO CNO2
PG611
1 CAPSTAN OUT
2 CFG (+)
3 CFG (−)
4 GND(S)
To REGU PG111 VIA CNO1
S601
REC SPEED SW
SP ← LP → EP
RA601
9V
16V
PB 9V
SERVO P.C.B

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.


TRACKING PRESET
CHI PHASE
CH2 PHASE
REF ADJ.
ZD601 HZ-6A1
D607 1SS133
D608 1SS133
D609 1SS133
REC/PB CYLINDER MOTOR SIGNAL
REC CYLINDER MOTOR SIGNAL
PB CYLINDER MOTOR SIGNAL
WAVEFORM
IC603 HA11749
MODE DET
V. REF
CURRENT SOURCE
PULSE GEN
DOUBLER
BUF
SAW/NG
S/H
CYLINDER SPEED
PG623
9V
CYL TACH PULS
GND
CYL OUT
CYL FG(+)
GND (M)
16V
To CYLINDER MOTOR CN023
RA601
IC604 HA11749
CAPSTAN SPEED
REC/PB CAPSTAN MOTOR SIGNAL
REC CAPSTAN MOTOR SIGNAL
PB CAPSTAN MOTOR SIGNAL
WAVEFORM
PG611
CAPSTAN OUT
CFG (+)
CFG (−)
GND(S)
To REGULATOR PG111 VIA CN011
D630 1SS133
D631 1SS133
D626 1SS133
D627 1SS133
D628 1SS133
D629 1SS133
D632 1SS133
IC605 MSL9372RS
TAPE SPEED DET
CHANGE DET
1/X
Hi:ON
S601
REC SPEED SW
SP ←→ LP ←→ EP
PB 9V
SERVO P.C.B

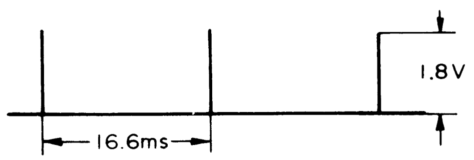
※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

Servo waveform diagram

The diagram below shows the waveforms obtained when the color bar signal (0.5Vp-p) is input to the video input jack and measured in the EP mode.

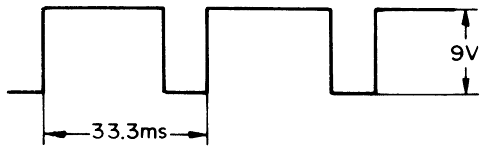
Note: (REC) shows the waveform obtained only during recording, and (PLAY), the waveform obtained only during play. SP shows the standard mode and EP, the triple speed mode.

40



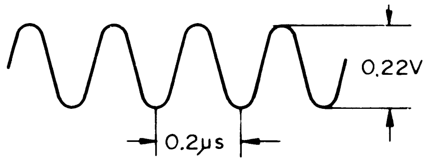
IC602-⑯ (REC)

41



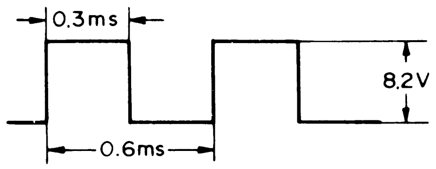
IC602-⑰ (REC)

42



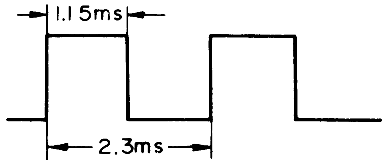
IC602-㉔ (REC/PLAY)

43


0.3ms
8.2V
0.6ms

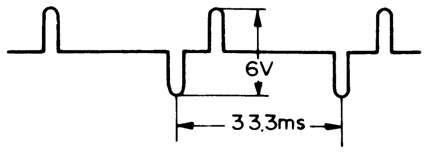
IC602-㉘ (REC/PLAY)

44



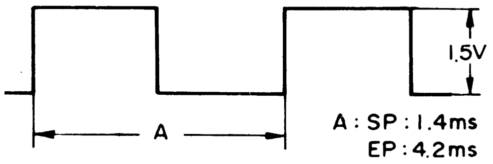
IC602-① (REC/PLAY)

45



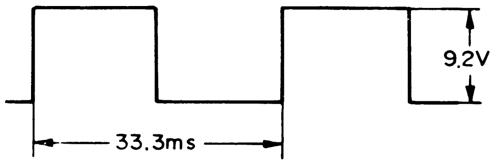
IC601-⑦ (REC)

46


1.5V
A
A : SP : 1.4ms
EP : 4.2ms

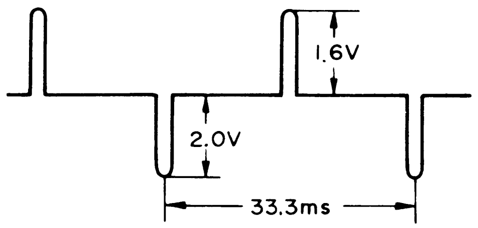
IC602-⑤ (REC)

47



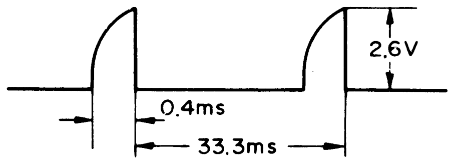
IC602-⑭ (REC/PLAY)

48


1.6V
2.0V
33.3ms

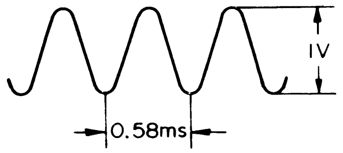
IC602-⑬ (REC/PLAY)

49


2.6V
0.4ms
33.3ms

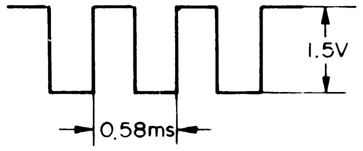
IC602-⑪
IC602-⑫ (REC/PLAY)

50



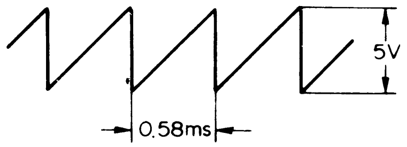
IC603-⑨ (REC/PLAY)

51



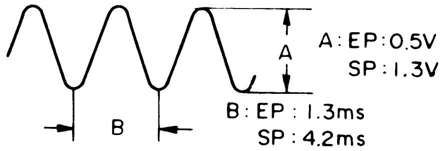
IC603-⑨ (REC/PLAY)

52



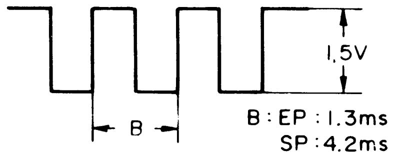
IC603-② (REC/PLAY)

53


A
A : EP : 0.5V
SP : 1.3V
B
B : EP : 1.3ms
SP : 4.2ms

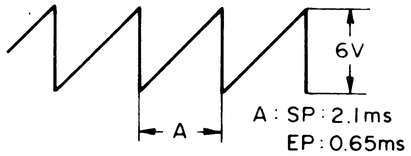
IC604-⑨ (REC/PLAY)

54


1.5V
B
B : EP : 1.3ms
SP : 4.2ms

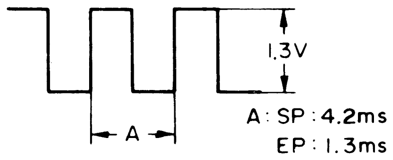
IC604-⑪ (REC/PLAY)

55


6V
A
A : SP : 2.1ms
EP : 0.65ms

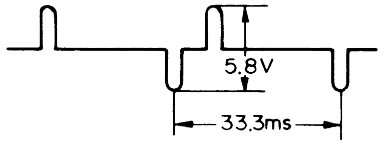
IC604-② (REC/PLAY)

56


1.3V
A
A : SP : 4.2ms
EP : 1.3ms

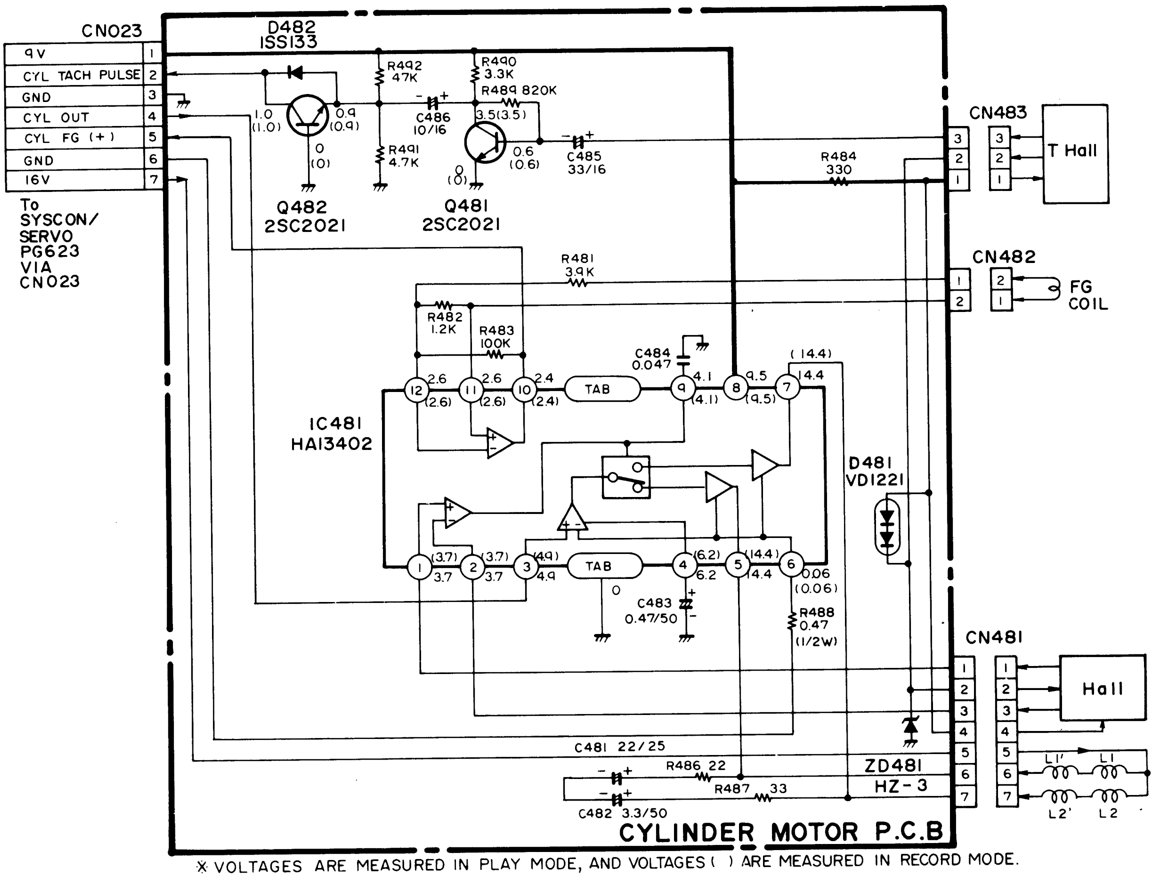
IC605-① (PLAY)

57

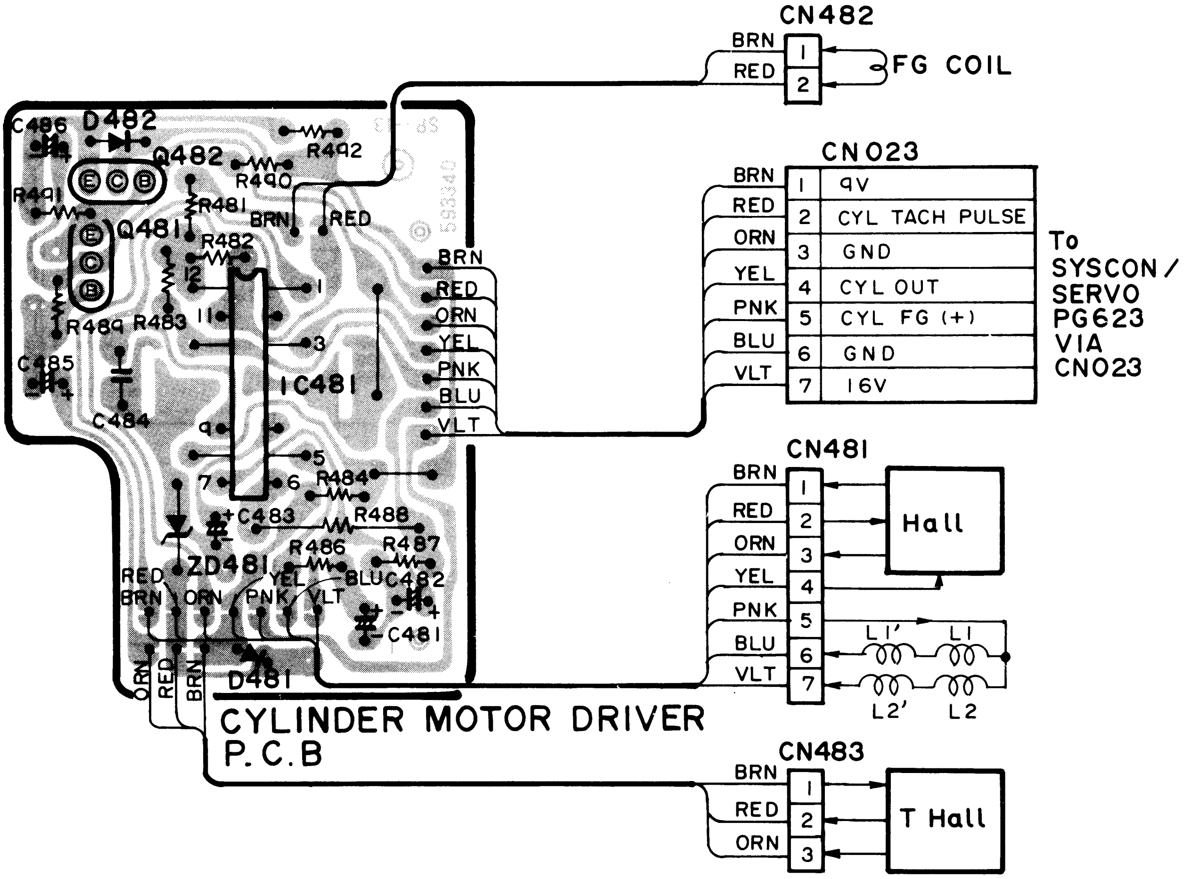


IC605-⑤ (PLAY)

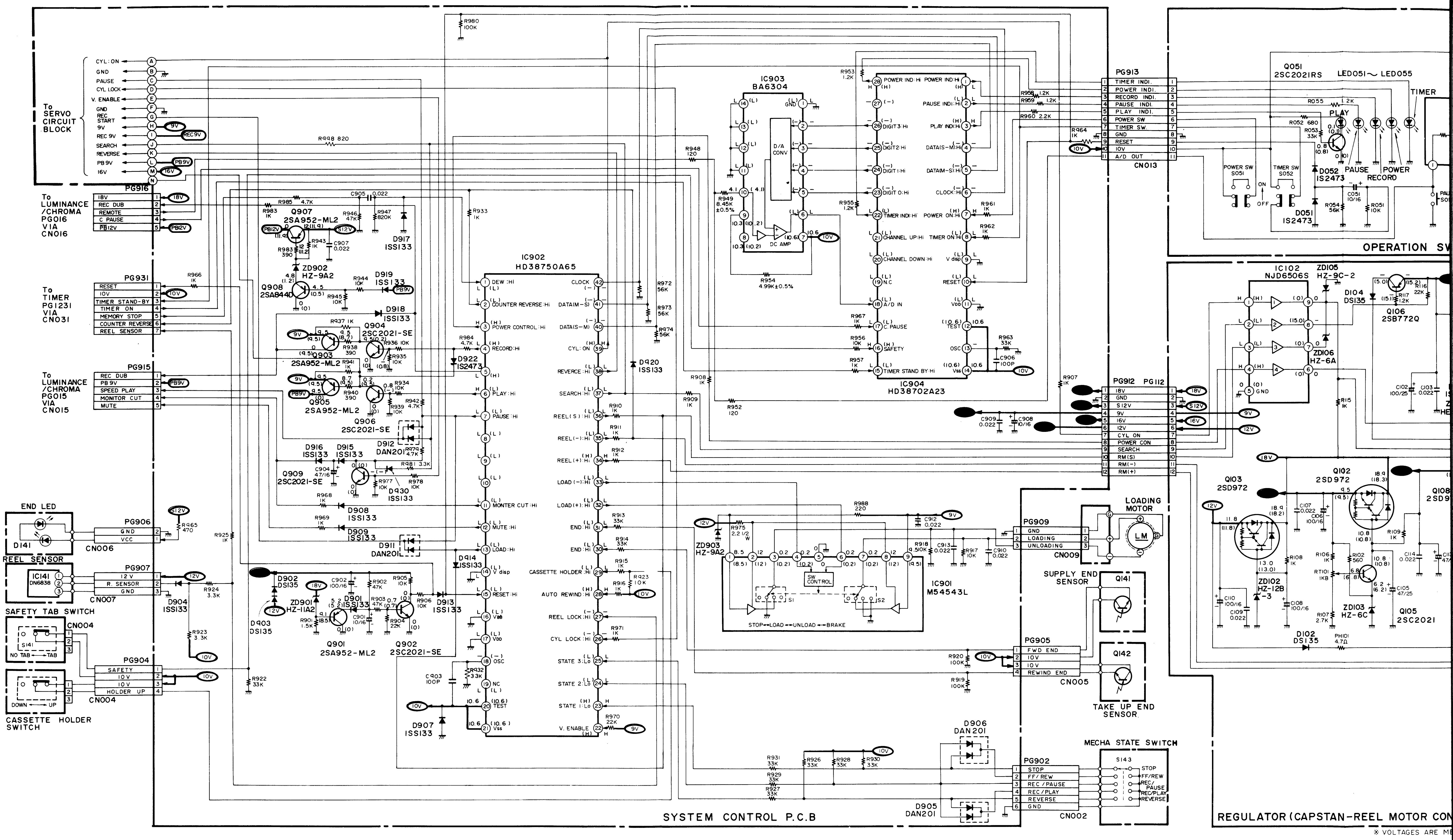
CYLINDER MOTOR

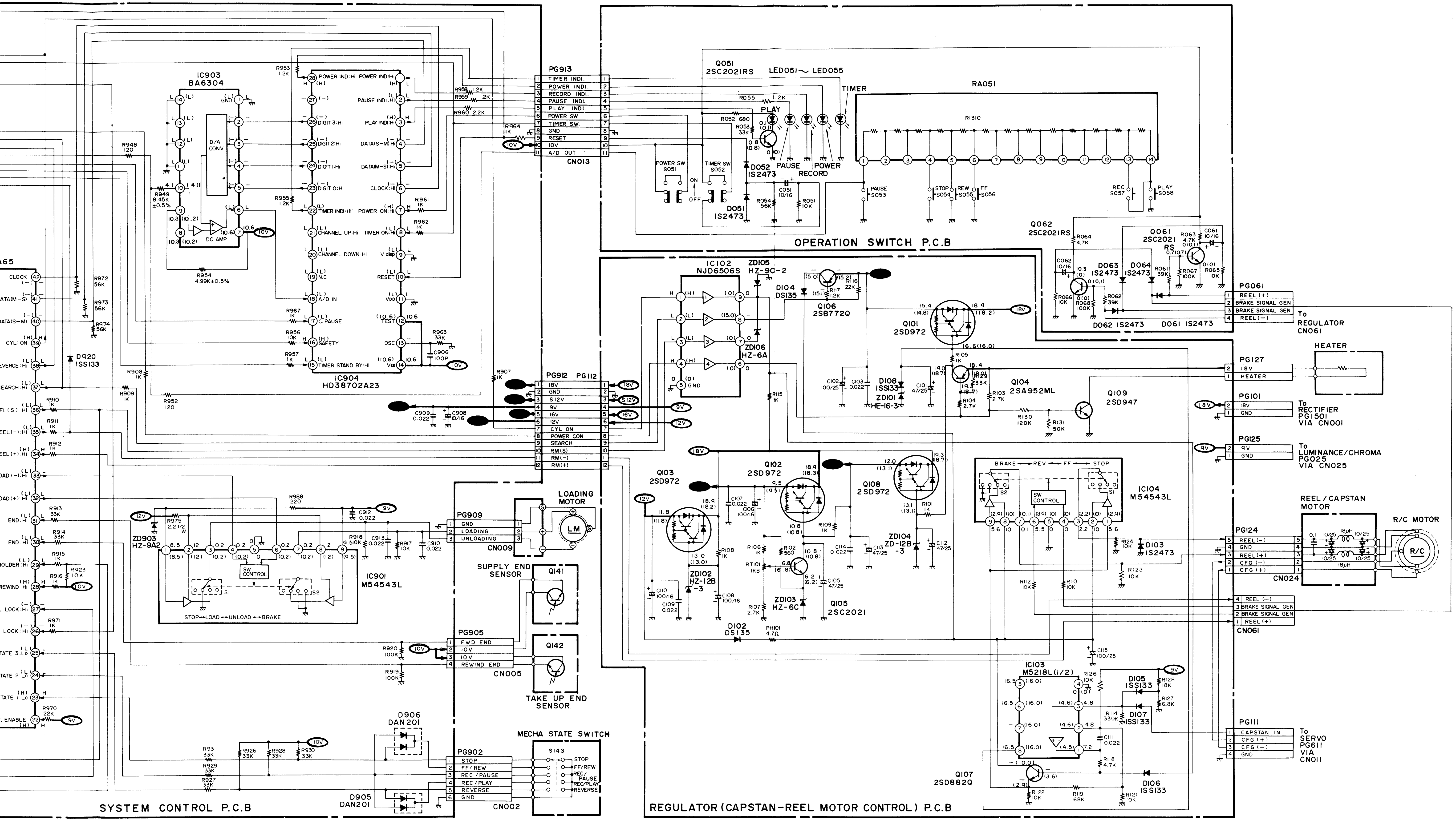

CN023
1 9V
2 CYL TACH PULSE
3 GND
4 CYL OUT
5 CYL FG (+)
6 GND
7 16V
To SYSCON/ SERVO PG623 VIA CN023
D482 1SS133
R492 4.7K
R490 3.3K
R489 820K
C486 10/16
R491 4.7K
C485 33/16
Q482 2SC2021
Q481 2SC2021
R484 330
CN483
T Hall
CN482
FG COIL
R481 3.9K
R482 1.2K
R483 100K
C484 0.047
IC481 HA13402
TAB
C483 0.47/50
R488 0.47 (1/2W)
D481 VD1221
CN481
Hall
L1' L1
L2' L2
C481 22/25
R486 22
R487 33
C482 3.3/50
ZD481 HZ-3
CYLINDER MOTOR P.C.B

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES ( ) ARE MEASURED IN RECORD MODE.


CN482
BRN
RED
FG COIL
CN023
1 9V
2 CYL TACH PULSE
3 GND
4 CYL OUT
5 CYL FG (+)
6 GND
7 16V
To SYSCON/ SERVO PG623 VIA CN023
BRN RED ORN YEL PNK BLU VLT
C486 D482 Q482 R492 R490 R491 R481 Q481 R482 R489 R483 C485 C484
IC481
R484 C483 R488 R486 R487 ZD481 C482 C481 D481
CN481
Hall
L1' L1 L2' L2
CYLINDER MOTOR DRIVER P.C.B
CN483
T Hall

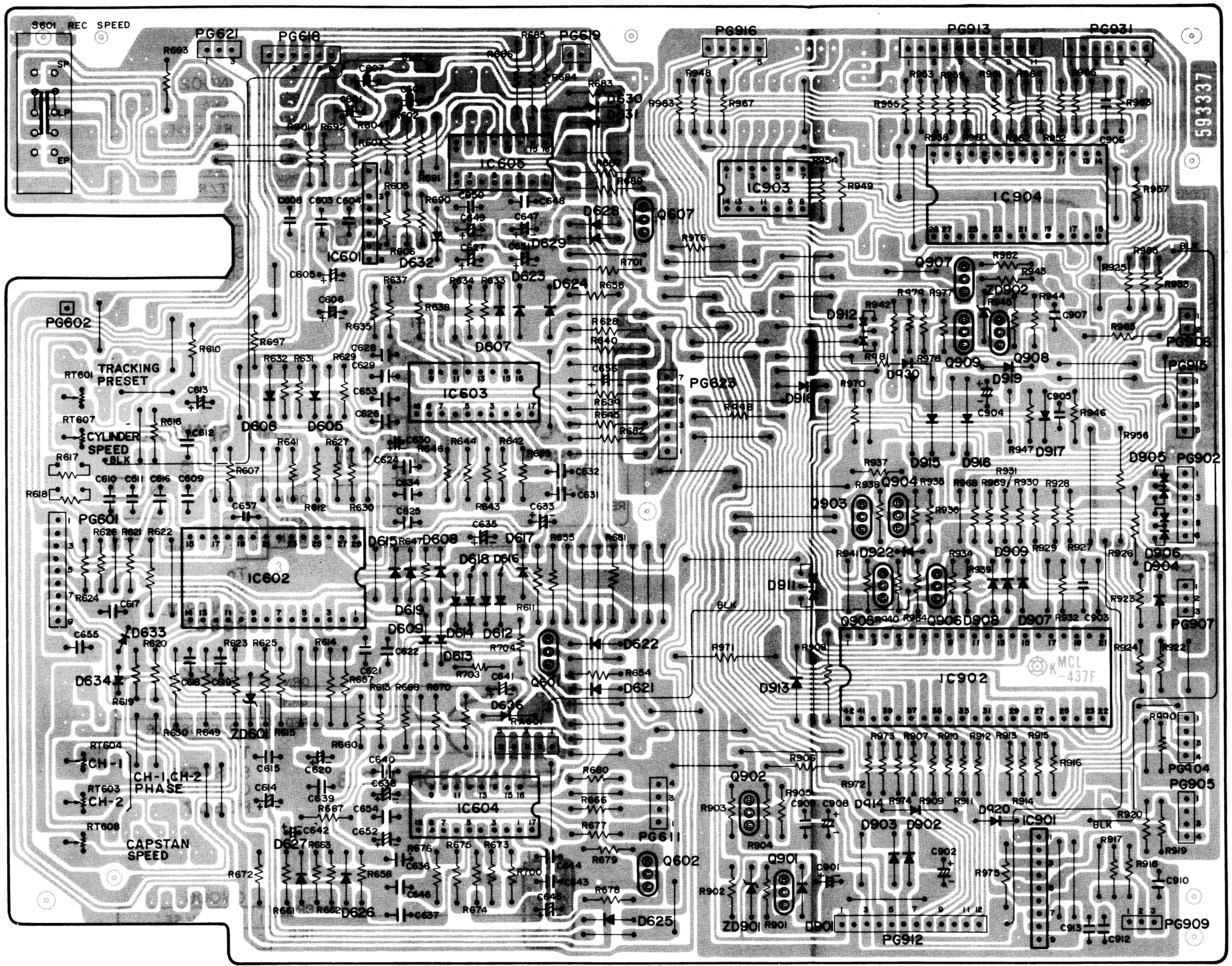
SYSTEM CONTROL/OPERATION SWITCH • REGULATOR


To SERVO CIRCUIT BLOCK
CYL: ON
GND
PAUSE
CYL LOCK
V. ENABLE
REC START
9V
REC 9V
SEARCH
REVERSE
PB 9V
16V
PG916
To LUMINANCE /CHROMA PG016 VIA CN016
18V
REC DUB
REMOTE
C PAUSE
PB12V
PG931
To TIMER PG1231 VIA CN031
RESET
10V
TIMER STAND-BY
TIMER ON
MEMORY STOP
COUNTER REVERSE
REEL SENSOR
PG915
To LUMINANCE /CHROMA PG015 VIA CN015
SPEED PLAY
MONITOR CUT
MUTE
END LED
D141
PG906
CN006
REEL SENSOR
IC141 DN6838
PG907
R. SENSOR
CN007
SAFETY TAB SWITCH
CN004
S141
NO TAB ↔ TAB
PG904
SAFETY
HOLDER UP
DOWN ↔ UP
CASSETTE HOLDER SWITCH
Q907 2SA952-ML2
Q908 2SA844D
ZD902 HZ-9A2
Q904 2SC2021-SE
Q903 2SA952-ML2
Q905 2SA952-ML2
Q906 2SC2021-SE
Q909 2SC2021-SE
D917 1SS133
D918 1SS133
D919 1SS133
D922 1S2473
D912 DAN201
D916 1SS133
D915 1SS133
D930 1SS133
D908 1SS133
D909 1SS133
D911 DAN201
D914 1SS133
D902 DS135
D903 DS135
D904 1SS133
ZD901 HZ-11A2
D901 1SS133
D913 1SS133
Q901 2SA952-ML2
Q902 2SC2021-SE
D907 1SS133
D920 1SS133
IC902 HD38750A65
DEW :HI
COUNTER REVERSE :Hi
POWER CONTROL :Hi
RECORD :Hi
PLAY :Hi
PAUSE :Hi
MONTER CUT :Hi
MUTE :Hi
LOAD :Hi
V disp
RESET :Hi
Vdd
OSC
NC
TEST
Vss
CLOCK
DATA(M-S)
DATA(S-M)
CYL: ON
REVERCE :Hi
SEARCH :Hi
REEL(S) :Hi
REEL(-) :Hi
REEL(+) :Hi
LOAD (-) :Hi
LOAD (+) :Hi
END :Hi
CASSETTE HOLDER :Hi
AUTO REWIND :Hi
REEL LOCK :Hi
CYL LOCK :Hi
STATE 3 :Lo
STATE 2 :Lo
STATE 1 :Lo
V. ENABLE
IC903 BA6304
D/A CONV
DC AMP
IC904 HD38702A23
POWER IND :Hi
DIGIT 3 :Hi
DIGIT 2 :Hi
DIGIT 1 :Hi
DIGIT 0 :Hi
TIMER IND :Hi
CHANNEL UP :Hi
CHANNEL DOWN :Hi
N.C
A/D IN
C. PAUSE
SAFETY
TIMER STAND BY :Hi
PAUSE IND :Hi
PLAY IND :Hi
DATA(S-M) :Hi
DATA(M-S) :Hi
CLOCK :Hi
POWER ON :Hi
TIMER ON :Hi
V disp
RESET
Vdd
TEST
OSC
Vss
PG913
TIMER INDI.
POWER INDI.
RECORD INDI.
PAUSE INDI.
PLAY INDI.
POWER SW
TIMER SW
GND
RESET
10V
A/D OUT
CN013
Q051 2SC2021RS
LED051 ~ LED055
TIMER
PLAY
PAUSE
POWER
RECORD
D052 1S2473
D051 1S2473
POWER SW S051
TIMER SW S052
ON OFF
OPERATION SW
PG912 PG112
18V
S12V
9V
16V
12V
CYL ON
POWER CON
SEARCH
RM(S)
RM(-)
RM(+)
ZD903 HZ-9A2
IC901 M54543L
SW CONTROL
STOP ↔ LOAD ↔ UNLOAD ↔ BRAKE
PG909
LOADING
UNLOADING
CN009
LOADING MOTOR
LM
SUPPLY END SENSOR
Q141
Q142
TAKE UP END SENSOR
PG905
FWD END
REWIND END
CN005
D906 DAN201
D905 DAN201
PG902
STOP
FF/REW
REC/PAUSE
REC/PLAY
REVERSE
CN002
MECHA STATE SWITCH
S143
SYSTEM CONTROL P.C.B
IC102 NJD6506S
ZD105 HZ-9C-2
D104 DS135
Q106 2SB772Q
ZD106 HZ-6A
Q103 2SD972
Q102 2SD972
ZD102 HZ-12B
ZD103 HZ-6C
D102 DS135
Q105 2SC2021
REGULATOR (CAPSTAN-REEL MOTOR CON
※ VOLTAGES ARE ME


IC903
BA6304
D/A CONV
DC AMP
IC904
HD38702A23
PG913
TIMER INDI.
POWER INDI.
RECORD INDI.
PAUSE INDI.
PLAY INDI.
POWER SW
TIMER SW
GND
RESET
10V
A/D OUT
CN013
Q051
2SC2021RS
LED051～LED055
TIMER
PLAY
PAUSE
POWER
RECORD
RA051
R1310
POWER SW
S051
TIMER SW
S052
D052
1S2473
D051
1S2473
PAUSE
S053
STOP
S054
REW
S055
FF
S056
REC
S057
PLAY
S058
OPERATION SWITCH P.C.B
Q062
2SC2021RS
Q061
2SC2021
RS
D063
1S2473
D064
1S2473
D062 1S2473
D061 1S2473
PG061
REEL (+)
BRAKE SIGNAL GEN
BRAKE SIGNAL GEN
REEL (−)
To
REGULATOR
CN061
HEATER
PG127
18V
HEATER
IC102
NJD6506S
ZD105
HZ-9C-2
D104
DS135
Q106
2SB772Q
Q101
2SD972
ZD106
HZ-6A
D108
1SS133
ZD101
HE-16-3
Q104
2SA952ML
Q109
2SD947
PG101
18V
GND
To
RECTIFIER
PG1501
VIA CN001
PG125
9V
GND
To
LUMINANCE/CHROMA
PG025
VIA CN025
PG912
PG112
18V
GND
S12V
9V
16V
12V
CYL ON
POWER CON
SEARCH
RM(S)
RM(−)
RM(+)
Q103
2SD972
Q102
2SD972
Q108
2SD972
ZD102
HZ-12B
-3
ZD103
HZ-6C
Q105
2SC2021
ZD104
ZD-12B
-3
D102
DS135
PH101
4.7Ω
IC104
M54543L
BRAKE ← REV ← FF ← STOP
SW CONTROL
D103
1S2473
REEL/CAPSTAN
MOTOR
R/C MOTOR
R/C
PG124
REEL (−)
GND
REEL (+)
CFG (−)
CFG (+)
CN024
REEL (−)
BRAKE SIGNAL GEN
BRAKE SIGNAL GEN
REEL (+)
CN061
IC103
M5218L(1/2)
D105
1SS133
D107
1SS133
Q107
2SD882Q
D106
1SS133
PG111
CAPSTAN IN
CFG (+)
CFG (−)
GND
To
SERVO
PG611
VIA
CN011
REGULATOR (CAPSTAN-REEL MOTOR CONTROL) P.C.B
LOADING
MOTOR
LM
PG909
GND
LOADING
UNLOADING
CN009
ZD903
HZ-9A2
IC901
M54543L
SW CONTROL
STOP ← LOAD → UNLOAD ← BRAKE
SUPPLY END
SENSOR
Q141
Q142
TAKE UP END
SENSOR
PG905
FWD END
10V
10V
REWIND END
CN005
D906
DAN201
D905
DAN201
PG902
STOP
FF/REW
REC/PAUSE
REC/PLAY
REVERSE
GND
CN002
MECHA STATE SWITCH
S143
STOP
FF/REW
REC/PAUSE
REC/PLAY
REVERSE
D420
1SS133
CLOCK
DATA(M−S)
DATA(S−M)
CYL ON
REVERCE
SEARCH
REEL(S)
REEL(−)
REEL(+)
LOAD(−)
LOAD(+)
END
END
HOLDER
REWIND
LOCK
LOCK
STATE 3
STATE 2
STATE 1
ENABLE
SYSTEM CONTROL P.C.B

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

SYSTEM CONTROL/SERVO CIRCUIT BOARD


S601 REC SPEED
SP
LP
EP
PG621
PG618
PG619
PG916
PG913
PG931
593337
IC605
IC903
IC904
IC601
IC603
IC602
IC604
IC902
MCL K-437F
IC901
PG602
RT601 TRACKING PRESET
RT607 CYLINDER SPEED
BLK
PG601
PG623
PG611
PG612
PG902
PG904
PG905
PG906
PG907
PG909
PG915
RT604 CH-1
RT603 CH-2
CH-1,CH-2 PHASE
RT608 CAPSTAN SPEED
Q601
Q602
Q607
Q901
Q902
Q903
Q904
Q906
Q907
Q908
Q909
ZD601
ZD901
ZD902

SYSTEM CONTROL / SERVO P.C.B

PG601

1	CTL OUT (TP601)	TEST POINT
2	FREE RUN (TP602)	
3	DISC SPEED (TP603)	
4	GND (TP604)	
5	————	
6	CAPS. SPEED (TP606)	
7	9V (TP607)	
8	REF ADJ. (TP608)	
9	SW30 (TP609)	

PG602

1	SW30Hz

PG611

4	GND(S)	To REGULATOR PG111 VIA CN011
3	CFG(−)	
2	CFG(+)	
1	CAPSTAN OUT	

PG618

1	SYNC	To LUMINANCE /CHROMA PG018 VIA CN018
2	3.58MHz	
3	GND	
4	EP	
5	LP	
6	SP	

PG619

1	CTL PULSE	To CONTROL HEAD
2	GND	

PG621

1	SW30	To LUMINANCE /CHROMA PG021 VIA CN021
2	TRACKING	
3	TRACKING	

PG623

7	16V	To CYLINDER MOTOR CN023
6	GND	
5	CYL FG(+)	
4	CYL OUT	
3	GND	
2	CYL TACH PULSE	
1	9V	

PG902

1	STOP	To MECHA STATE SENSOR SW. CN002
2	FF/REW	
3	REC/PAUSE	
4	REC/PLAY	
5	REVERSE	
6	GND	

PG904

1	SAFETY	To SAFETY TAB SW.CN007
2	10V	
3	10V	CASSETTE HOLDER SW.
4	HOLDER UP	

PG905

1	FWD END	To SUPPLY END SENSOR
2	10V	
3	10V	TAKE UP END SENSOR
4	REWIND END	

PG906

1	LED PULSE	To END LED
2	GND	

PG907

1	12V	To REEL LOCK SENSOR
2	R. SENSOR	
3	GND	

PG909

1	GND	To LOADING MOTOR
2	UNLOADING	
3	LOADING	

PG912

1	18V	To REGULATOR PG112
2	GND	
3	12V	
4	9V	
5	16V	
6	12V	
7	DL 5K ON	
8	POWER CON	
9	SEARCH	
10	RM (S)	
11	RM (−)	
12	RM (+)	

PG913

1	TIMER INDI.	To OPERATION SWITCH PG013
2	POWER INDI.	
3	RECORD INDI.	
4	PAUSE INDI.	
5	PLAY INDI.	
6	POWER SW	
7	TIMER SW	
8	GND	
9	RESET	
10	10V	
11	A/D OUT	

PG915

1	REC DUB	To LUMINANCE /CHROMA PG015 VIA CN015
2	PB9V	
3	SPEED PLAY	
4	MONITOR CUT	
5	MUTE	

PG916

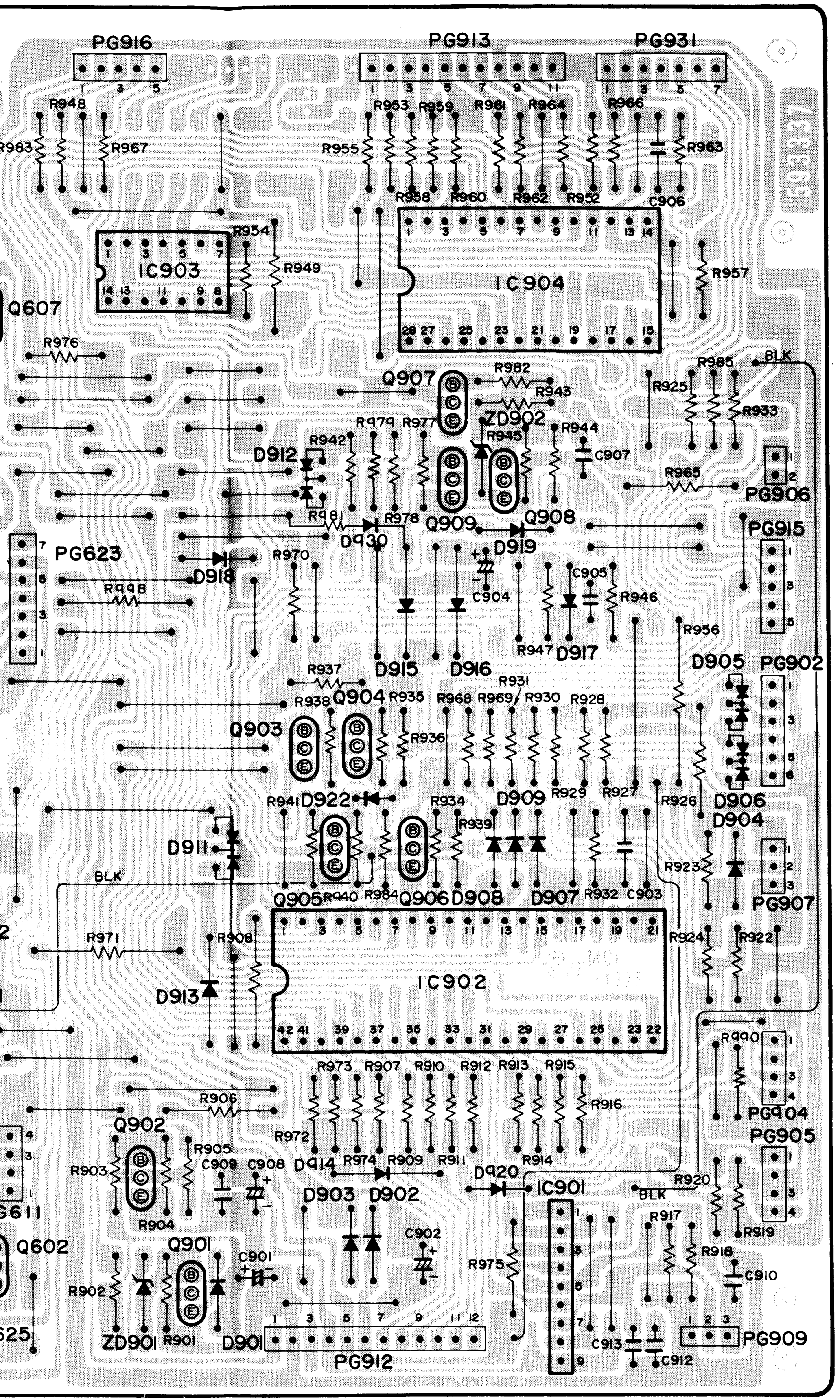
1	18V	To LUMINANCE /CHROMA PG016 VIA CN015
2	REC DUB	
3	REMOTE	
4	C. PAUSE	
5	$\overline{\text{PB}}$12V	

PG931

1	RESET	To TIMER PG1231 VIA CN031
2	10V	
3	TIMER STAND-BY	
4	TIMER ON	
5	MEMORY STOP	
6	COUNTER REVERSE	
7	REEL SENSOR	

1
L(L)
42
−(−)

※ VOLT



SYSTEM CONTROL / SERVO P.C.B

PG601

1	CTL OUT (TP601)	TEST POINT
2	FREE RUN (TP602)	
3	DISC SPEED (TP603)	
4	GND (TP604)	
5	————	
6	CAPS. SPEED (TP606)	
7	9V (TP607)	
8	REF ADJ. (TP608)	
9	SW30 (TP609)	

PG602

1	SW30Hz

PG611

4	GND(S)	To REGULATOR PG111 VIA CN011
3	CFG (−)	
2	CFG (+)	
1	CAPSTAN OUT	

PG618

1	SYNC	To LUMINANCE /CHROMA PG018 VIA CN018
2	3.58MHz	
3	GND	
4	EP	
5	LP	
6	SP	

PG619

1	CTL PULSE	To CONTROL HEAD
2	GND	

PG621

1	SW30	To LUMINANCE /CHROMA PG021 VIA CN021
2	TRACKING	
3	TRACKING	

PG623

7	16V	To CYLINDER MOTOR CN023
6	GND	
5	CYL FG(+)	
4	CYL OUT	
3	GND	
2	CYL TACH PULSE	
1	9V	

PG902

1	STOP	To MECHA STATE SENSOR SW. CN002
2	FF/REW	
3	REC/PAUSE	
4	REC/PLAY	
5	REVERSE	
6	GND	

PG904

1	SAFETY	To SAFETY TAB SW.CN007
2	10V	
3	10V	CASSETTE HOLDER SW.
4	HOLDER UP	

PG905

1	FWD END	To SUPPLY END SENSOR
2	10V	
3	10V	TAKE UP END SENSOR
4	REWIND END	

PG906

1	LED PULSE	To END LED
2	GND	

PG907

1	12V	To REEL LOCK SENSOR
2	R. SENSOR	
3	GND	

PG909

1	GND	To LOADING MOTOR
2	UNLOADING	
3	LOADING	

PG912

1	18V	To REGULATOR PG112
2	GND	
3	12V	
4	9V	
5	16V	
6	12V	
7	DL 5K ON	
8	POWER CON	
9	SEARCH	
10	RM (S)	
11	RM (−)	
12	RM (+)	

PG913

1	TIMER INDI.	To OPERATION SWITCH PG013
2	POWER INDI.	
3	RECORD INDI.	
4	PAUSE INDI.	
5	PLAY INDI.	
6	POWER SW	
7	TIMER SW	
8	GND	
9	RESET	
10	10V	
11	A/D OUT	

PG915

1	REC DUB	To LUMINANCE /CHROMA PG015 VIA CN015
2	PB9V	
3	SPEED PLAY	
4	MONITOR CUT	
5	MUTE	

PG916

1	18V	To LUMINANCE /CHROMA PG016 VIA CN015
2	REC DUB	
3	REMOTE	
4	C. PAUSE	
5	$\overline{\text{PB}}$12V	

PG931

1	RESET	To TIMER PG1231 VIA CN031
2	10V	
3	TIMER STAND-BY	
4	TIMER ON	
5	MEMORY STOP	
6	COUNTER REVERSE	
7	REEL SENSOR	

IC601

1	2.0(0.1)
2	—
3	0.6 (0)
4	0(0.01)
5	0(0.01)
6	0.7(1.1)
7	4.0(1.0)
8	7.0(2.0)

IC604

		9	10	11	12	13	14	15	16	
			5.1(5.1)	5.1(5.1)	5.1(5.1)				9.5(9.5)	
SP		5.1(5.1)				4.0(4.0)	4.7(4.7)	4.8(4.8)		
LP		5.2(5.2)				0 (0)	2.4(2.4)	0 (0)		
EP		5.1(5.1)				8.1(8.1)	0(0)	1.8(1.8)		
REW. FF		5.9	6.0	6.0	6.0	8.0	0.1	1.7	9.5	
	18	8	7	6	5	4	3	2	1	17
	0 (0)		4.8(4.8)		4.6(4.6)			0.6(0.6)		
SP		5.3(5.3)		4.4(4.7)		4.6(4.6)	4.5(4.4)		4.6(4.6)	4.8(4.8)
LP		5.2(5.2)		4.4(4.7)		5.0(4.8)	4.9(4.7)		2.4(2.4)	2.5(2.5)
EP		5.1(5.1)		4.5(4.5)		5.2(5.0)	5.2(5.6)		1.7(1.7)	1.7(1.7)
REW. FF	0	0.03	4.7	4.7	5.0	6.6	0.5	9.5	1.8	1.7

IC602

15	16	17	18	19	20	21	22	23	24	25	26	27	28
8.9(8.9)	0.2(0.2)	0.2(0.8)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2.2(2.2)	5.4(5.2)	0 (0)	0 (0)	4.8(4.8)
14	13	12	11	10	9	8	7	6	5	4	3	2	1
0 (0)	1.2(1.2)	0 (0)	0 (0)	1.2(1.2)	1.6(1.6)	0 (0)	0 (0)	0(8.1)	2.2(2.2)	2.2(2.2)	SP:3.2(3.2) LP: 0(0) EP:6.8(6.8)	0 (0)	4.8(4.8)

IC603

	9	10	11	12	13	14	15	16	
	5.2(5.2)	5.2(5.2)	5.2(5.2)	5.2(5.2)	0 (0)	4.7(4.6)	0 (0)	8.8(8.8)	
18	8	7	6	5	4	3	2	1	17
0 (0)	4.9(4.9)	4.6(4.6)	4.6(4.6)	4.8(4.8)	4.8(4.8)	4.4(4.4)	0.7(0.7)	4.6(4.6)	4.2(4.2)

Q607

B	0(0)
C	9.5(9.5)
E	0 (0)

IC605

	9	10	11	12	13	14	15	16
			8.8(0)	9.5(9.5)	SP:3.2(3.2) EP:6.8(6.8)	SP 8.6(8.6)	EP 9.4(9.4)	LP 8.7(8.7)
REW. FF	0.02	0.03	0.02		6.9	8.7		
	8	7	6	5	4	3	2	1
	3.1(0)	SP:0.8(4.7) LP: 0.8(0) EP:0.4(9.5)	0.4(0.4)	4.0(1.4)				SP(3.9) 3.9LP(3.9) EP(3.6)
REW. FF	0.02	9.5		3.9		2.9	1.4	3.9

Q601

		REW. FF	SEARCH
B	9.6(9.6)	8.1	9.6
C	0 (0)	8.7	0
E	9.2(9.2)	8.8	9.2

Q602

		REW. FF	SEARCH
B	0(0)	0	0.7
C	1.8 1.8	1.8	0.02
E	0 (0)	0	0

IC901

		LOAD	UNL
1	8.5(8.5)		
2	12 (12)		
3	0.2(0.2)	8.7(8.7)	
4	0.2(0.2)	10.2(10.2)	
5	0 (0)		
6	0.2(0.2)		10.2(10.2)
7	0.2 (0.2)		8.7(8.7)
8	12 (12)		
9	9.5(9.5)		

Q901

B	9.1(8.5)
C	0 (0)
E	5.2(5.2)

Q902

B	0.7(0.7)
C	0 (0)
E	0 (0)

Q903

B	9.5(8.7)
C	0(9.5)
E	9.5(9.5)

Q904

B	− (0.8)
C	9.5(0.2)
E	0 (0)

Q905

B	8.7(9.5)
C	9.5 (0)
E	9.5(9.5)

Q906

B	0.8(−)
C	0.2(9.5)
E	0 (0)

Q907

B	12 (11.2)
C	0(11.9)
E	12(11.9)

Q908

B	4.5(0.5)
C	0 (0)
E	4.8(1.2)

Q909

B	— (—)
C	0 (0)
E	0 (0)

IC903

1	2	3	4	5	6	7
L (L)	— (—)	— (—)	— (—)	— (—)	L (L)	10.6(10.6)
14	13	12	11	10	9	8
L (L)	L (L)	L (L)	L (L)	4.1(4.1)	10.3(10.2)	10.3(10.2)

IC904

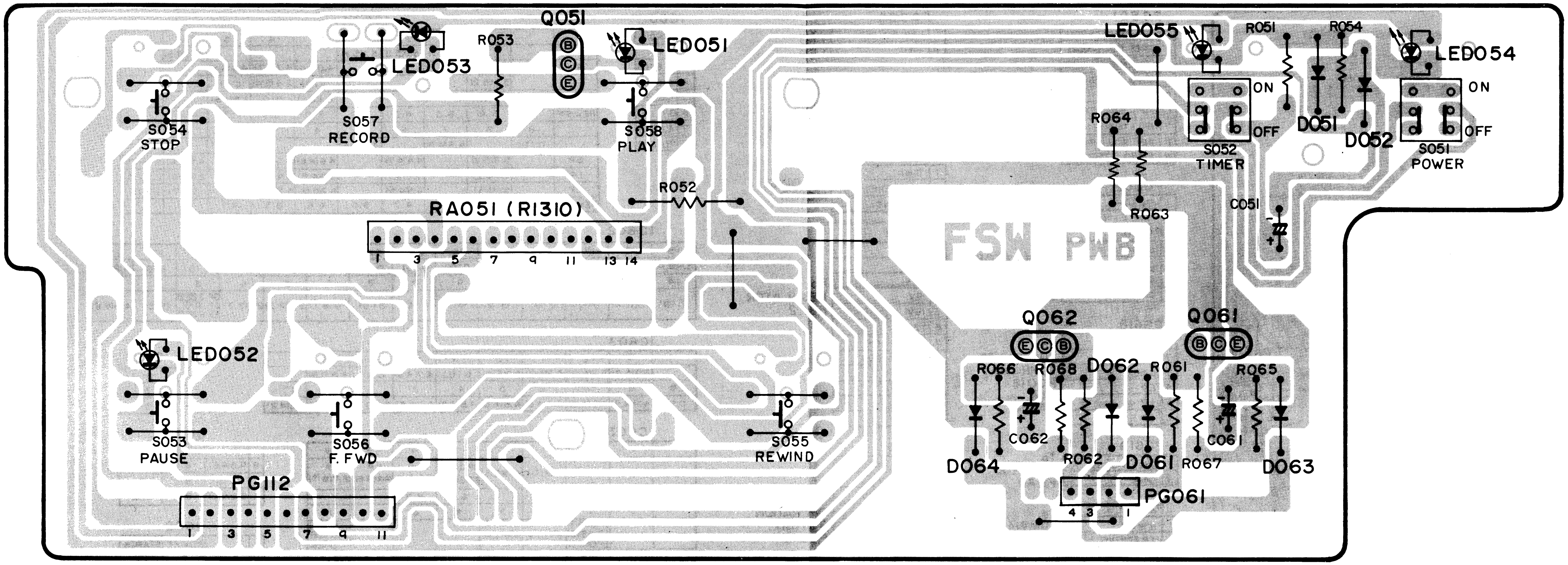
1	2	3	4	5	6	7	8	9	10	11	12	13	14
L(H)	L (L)	H (H)	— (—)	— (—)	— (—)	H (H)	L (L)	L (L)	L (L)	L (L)	10.6(10.6)	—	10.6 (10.6)
28	27	26	25	24	23	22	21	20	19	18	17	16	15
H (H)	— (—)	— (—)	— (—)	— (—)	— (—)	L (L)	L (L)	L (L)	L (L)	L (L)	L (L)	H (H)	L (L)

IC902

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
L (L)	L (L)	H(H)	L(H)	L(H)	H(L)	L(L)	L(L)	L (L)	L(L)	L(L)	L(L)	L (L)	L (L)	L(L)	L(L)	L(L)	−(−)	L(L)	10.6(10.6)	10.6(10.6)
42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22
−(−)	−(−)	−(−)	H(H)	L(L)	L (L)	L (L)	L(L)	H(H)	L(L)	L(L)	L(L)	L(L)	L(L)	H(H)	−(−)	−(−)	L(L)	L(L)	H(H)	H(H)

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

OPERATION SWITCH CIRCUIT BOARD


Q051
B
C
E
R053
LED053
LED051
S054
STOP
S057
RECORD
S058
PLAY
R052
RA051 (R1310)
1 3 5 7 9 11 13 14
LED055
R051
R054
LED054
ON
OFF
S052
TIMER
D051
D052
S051
POWER
R064
R063
C051
FSW PWB
Q062
E C B
Q061
B C E
R066
R068
D062
R061
R065
C062
C061
D064
R062
D061
R067
D063
PG061
4 3 1
LED052
S053
PAUSE
S056
F. FWD
S055
REWIND
PG112
1 3 5 7 9 11

OPERATION SWITCH P.C.B

PG112

1	TIMER INDI.
2	POWER INDI.
3	RECORD INDI.
4	PAUSE INDI.
5	PLAY INDI.
6	POWER SW
7	TIMER SW
8	GND
9	RESET
10	10V
11	A/D OUT

To
SYSTEM
CONTROL
PG913

PG061

1	REEL (+)
2	BRAKE SIGNAL GEN
3	BRAKE SIGNAL GEN
4	REEL (−)

To
REGULATOR
CN061

Q051

		STOP	REW. FF	SEARCH
B	0.8(0.8)	0	0	0.8
C	0.1(0.1)	9.0	9.0	0.1
E	0 0	0	0	0

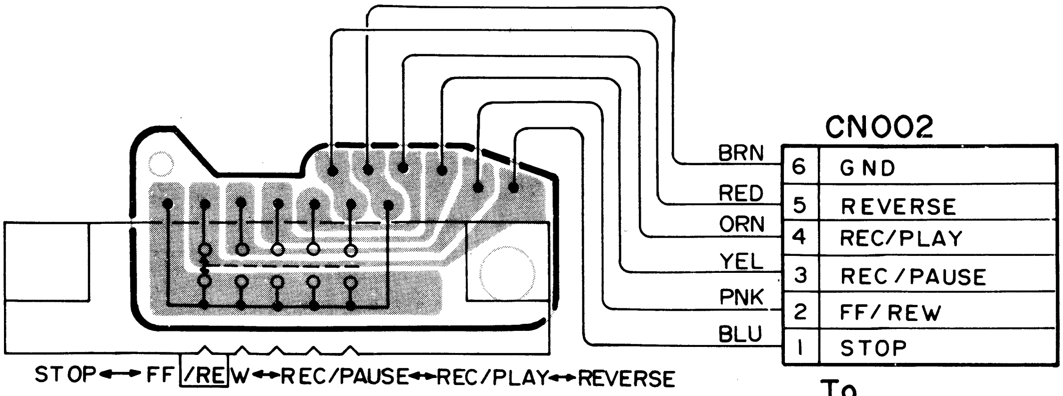
Q061

		STOP	REW. FF	F. FWD	R. SEARCH	F. SEARCH
B	0.7 (0.7)	0	0	0.7	0.1	0.7
C	0 (0.1)	10.5	10.3	0	10.4	0.1
E	0 (0)	0	0	0	0	0

Q062

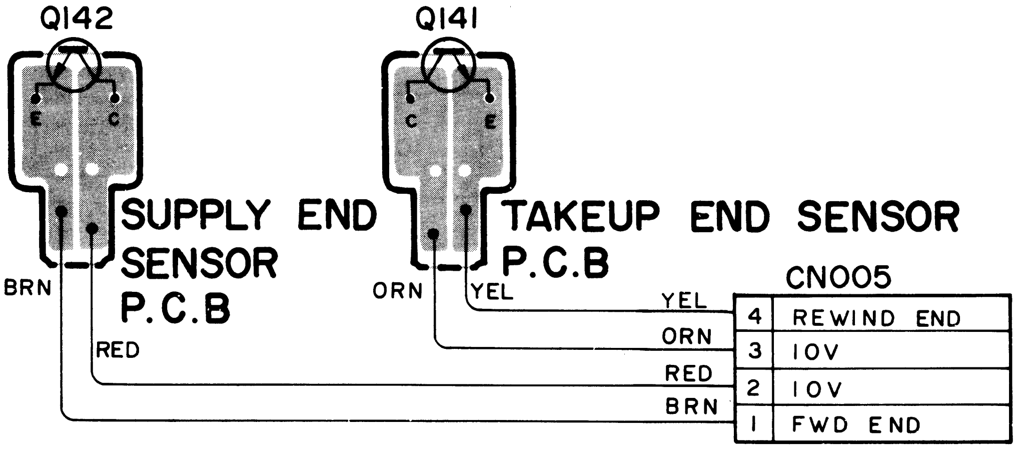
		STOP	REW. FF	F. FWD	R. SEARCH	F. SEARCH
B	0 (0.7)	0	0.1	0	0.7	0
C	10.3 (0)	10.5	0	10.3	0	10.3
E	0 (0)	0	0	0	0	0

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.


CN002
BRN
6
GND
RED
5
REVERSE
ORN
4
REC/PLAY
YEL
3
REC/PAUSE
PNK
2
FF/REW
BLU
1
STOP
STOP←→FF/REW←→REC/PAUSE←→REC/PLAY←→REVERSE

MECHA STATE SWITCH P.C.B

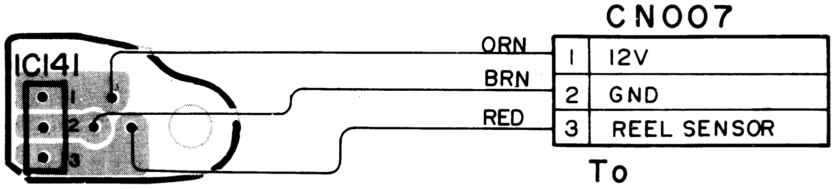
To
SYSTEM
CONTRON
PG902


Q142
E
C
Q141
C
E
BRN
RED
ORN
YEL
CN005
YEL
4
REWIND END
ORN
3
10V
RED
2
10V
BRN
1
FWD END

SUPPLY END SENSOR P.C.B

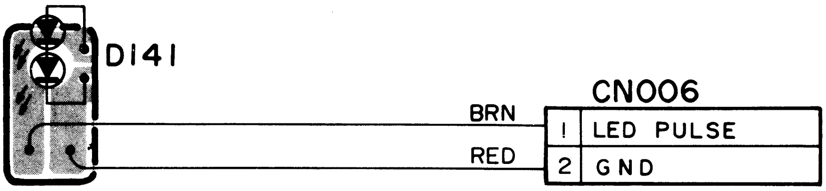
TAKEUP END SENSOR P.C.B

To
SYSTEM
CONTROL
PG905


CN007
IC141
1
2
3
ORN
1
12V
BRN
2
GND
RED
3
REEL SENSOR

REEL SENSOR P.C.B

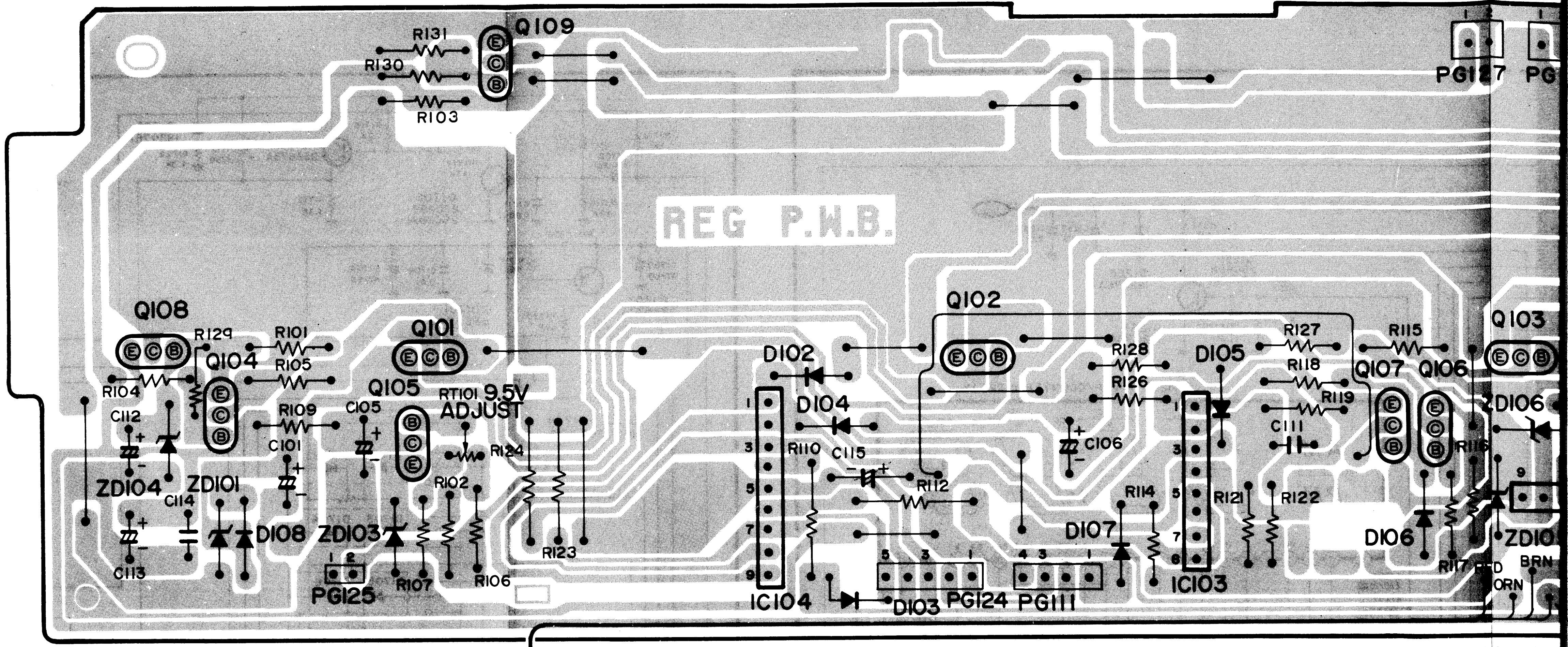
To
SYSTEM
CONTROL
PG907


D141
CN006
BRN
1
LED PULSE
RED
2
GND

END LED P.C.B

To
SYSTEM
CONTROL
PG906

REGULATOR CIRCUIT BOARD


Q109
R131
R130
R103
E
C
B
PG127
REG P.W.B.
Q108
R129
R101
Q101
R104
Q104
R105
Q105
RT101 9.5V ADJUST
C112
R109
C105
C101
R124
ZD104
ZD101
C114
R102
D108
ZD103
C113
R123
PG125
R107
R106
Q102
D102
D104
R110
C115
R112
IC104
D103
PG124
PG111
R128
R126
D105
C106
R114
D107
R127
R118
R119
R115
Q107
Q106
Q103
C111
R121
R122
IC103
ZD106
D106
R116
R117
RED
ORN
BRN
ZD1

REGULATOR

PG101

2	18V
1	GND

To
RECTIFIER
PG1501
VIA
CN001

PG111

1	CAPSTAN IN
2	CFG (+)
3	CFG (−)
4	GND

To
SERVO
PG611
VIA
CN011

PG124

5	REEL(−)
4	GND
3	REEL(+)
2	CFG(−)
1	CFG(+)

CAPSTAN
MOTOR
DRIVER

PG125

2	9V
1	GND

To
LUMINANCE
/CHROMA
PG025
VIA CN025

CN061

4	REEL (+)
3	BRAKE SIGNAL GEN
2	BRAKE SIGNAL GEN
1	REEL (−)

ORN
RED
BRN

To OPERATION SW PG016

PG112

1	18V
2	GND
3	S12V
4	9V
5	16V
6	12V
7	DISK ON
8	POWER CONT.
9	SEARCH
10	RM(S)
11	RM(−)
12	RM(+)

To
SYSCON
/SERVO
PG912

IC102

	9	8	7	6	5	4	3	2	1
	0(0)	−(15.0)	0 (0)	0 (0)	0 (0)	H (H)	L (L)	L (L)	H (H)
REW. FF	9.3	16.8	6.2	—	—	—	—	—	—

IC103

		REW. FF	SEARCH
1	7.2(4.5)	1.4	R 15.9 F 14.7
2	4.8(4.6)	5.0	5.3
3	4.8(4.6)	2.2	5.3
4	0(0)	0	0
5	16.5(16.0)	16.8	16.2
6	16.5(16.0)	16.8	16.2
7	− 16.0	16.3	16.2
8	16.5(16.0)	16.8	16.2

IC104

		REW. FF	SEARCH
1	5.6(2.9)	8.0	14.1
2	10(10)	10	14.5
3	2.2(2.2)	0.1	0.2
4	0(0)	5.5	5.5
5	0(0)	0	0
6	5.5(3.9)	0	0
7	0.1(0.1)	7.2	13.3
8	10(10)	10	14.5
9	5.6(2.9)	8.0	14.1

Q101

		STOP	REW. FF	SEARCH
B	16.6(16.0)	16.8	16.8	16.7
C	18.9(18.2)	19.9	19.3	18.6
E	15.4(14.8)	16.8	16.8	15.4

Q102

		STOP	REW. F
B	10.8(10.8)	9.5	10.7
C	18.9(18.3)	19.8	19.3
E	9.5(9.5)	9.5	9.5

Q104

		STOP	REW. FF	SEARCH
B	19.3(18.7)	20.5	19.8	19.1
C	19(18.7)	20.5	19.9	19.0
E	18.4(18)	19.7	19.1	18.4

Q105

		STOP	REW. F
B	6.8(6.8)	6.8	6.8
C	10.8(10.8)	10.7	10.7
E	6.2(6.2)	6.3	6.2

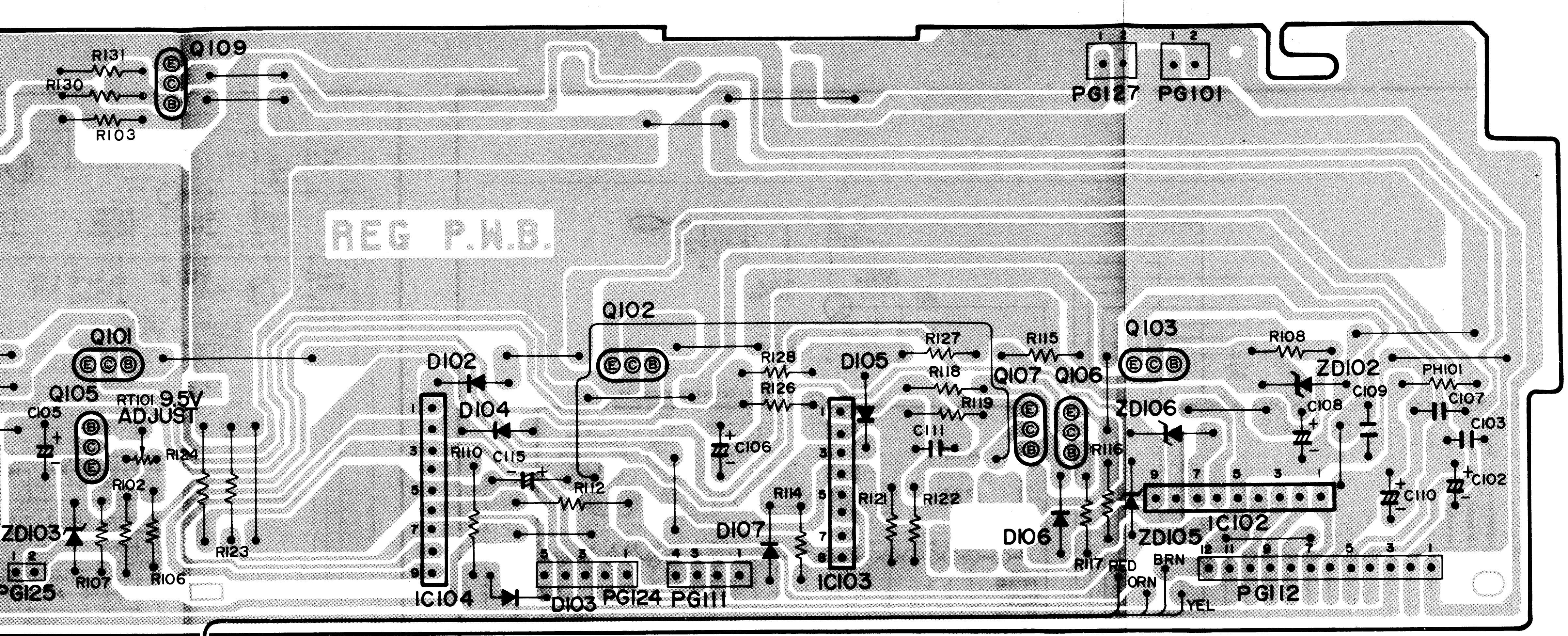
Q107

		STOP	REW. FF	SEARCH
B	−(3.6)	8.6	8.6	14.9
C	−(10)	11.4	10.1	14.6
E	−(2.9)	8.1	8.0	13

Q108

		STOP	REW. F
B	13.1(13.1)	12	13.2
C	19.3(18.7)	20.4	19.9
E	12(13.1)	12	12

※ VOLTAGES ARE MEASURED IN PLAY MODE , AND
VOLTAGES IN ( ) ARE MEASURED IN RECORD MOD


REG P.W.B.
Q109
E C B
R131
R130
R103
PG127
PG101
1 2
Q101
E C B
Q105
B C E
C105
RT101 9.5V ADJUST
R124
R102
ZD103
PG125
R107
R106
R123
Q102
D102
D104
IC104
R110
C115
R112
D103
PG124
PG111
R128
R126
C106
R114
D107
D105
IC103
R121
R122
R127
R115
R118
R119
C111
Q107
Q106
R116
D106
R117
RED
ORN
BRN
YEL
Q103
R108
ZD102
ZD106
ZD105
PH101
C109
C108
C107
C103
C110
C102
IC102
PG112

REGULATOR P.C.B

25

D

IINANCE
ROMA
25
CN025

061

EL (+)	ORN
KE SIGNAL GEN	RED
KE SIGNAL GEN	BRN
EL (−)	

PERATION SW PG016
12

V
D
2V
V
V
SK ON
WER CONT.
ARCH
1(S)
1(−)
1(+)

To
SYSCON
/SERVO
PG912

IC102

	9	8	7	6	5	4	3	2	1
	0 (0)	−(15.0)	0 (0)	0 (0)	0 (0)	H (H)	L (L)	L (L)	H (H)
REW. FF	9.3	16.8	6.2	—	—	—	—	—	—

IC103

		REW. FF	SEARCH
1	7.2(4.5)	1.4	R 15.9 F 14.7
2	4.8(4.6)	5.0	5.3
3	4.8(4.6)	2.2	5.3
4	0 (0)	0	0
5	16.5(16.0)	16.8	16.2
6	16.5(16.0)	16.8	16.2
7	− 16.0	16.3	16.2
8	16.5(16.0)	16.8	16.2

IC104

		REW. FF	SEARCH
1	5.6(2.9)	8.0	14.1
2	10 (10)	10	14.5
3	2.2(2.2)	0.1	0.2
4	0 (0)	5.5	5.5
5	0 (0)	0	0
6	5.5(3.9)	0	0
7	0.1(0.1)	7.2	13.3
8	10(10)	10	14.5
9	5.6(2.9)	8.0	14.1

Q101

		STOP	REW. FF	SEARCH
B	16.6(16.0)	16.8	16.8	16.7
C	18.9(18.2)	19.9	19.3	18.6
E	15.4(14.8)	16.8	16.8	15.4

Q102

		STOP	REW. FF	SEARCH
B	10.8(10.8)	9.5	10.7	10.8
C	18.9(18.3)	19.8	19.3	18.6
E	9.5(9.5)	9.5	9.5	9.5

Q103

		STOP	REW. FF	SEARCH
B	13 (13)	11.9	13.0	13.0
C	18.9(18.2)	19.9	19.3	18.6
E	11.8(11.8)	11.9	11.8	11.9

Q104

		STOP	REW. FF	SEARCH
B	19.3(18.7)	20.5	19.8	19.1
C	19(18.7)	20.5	19.9	19.0
E	18.4(18)	19.7	19.1	18.4

Q105

		STOP	REW. FF	SEARCH
B	6.8(6.8)	6.8	6.8	6.9
C	10.8(10.8)	10.7	10.7	10.8
E	6.2(6.2)	6.3	6.2	6.2

Q106

		STOP	REW. FF	SEARCH
B	−(15.1)	16.8	16.6	14.6
C	−(5.0)	6.8	REW. 7.6 FF 2.2	15.3
E	−(15.2)	16.9	16.8	15.4

Q107

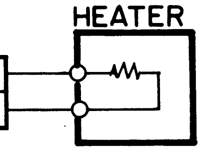
		STOP	REW. FF	SEARCH
B	−(3.6)	8.6	8.6	14.9
C	−(10)	11.4	10.1	14.6
E	−(2.9)	8.1	8.0	13

Q108

		STOP	REW. FF	SEARCH
B	13.1(13.1)	12	13.2	13.1
C	19.3(18.7)	20.4	19.9	19
E	12(13.1)	12	12	12

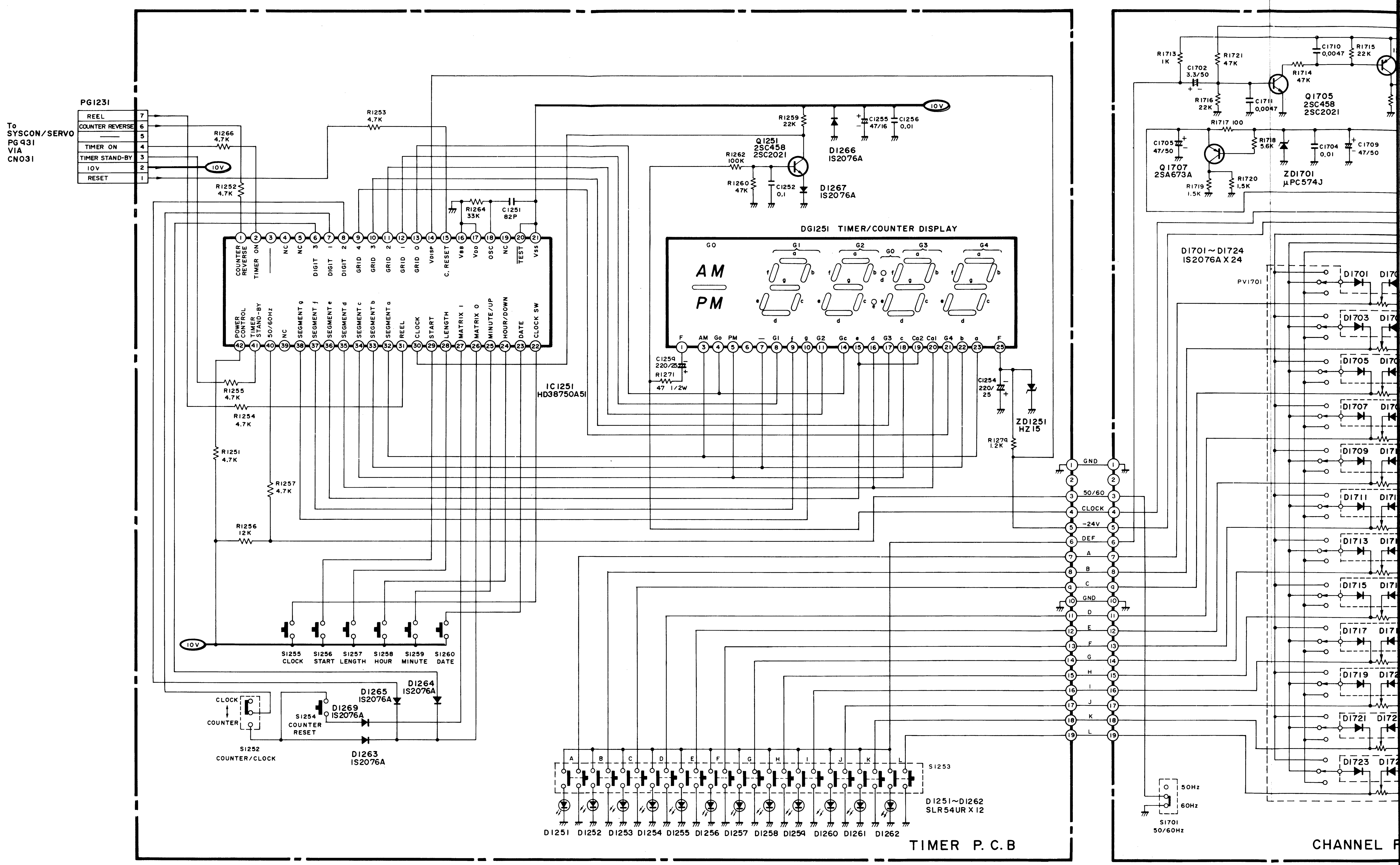
PG127

2	18V
1	HEATER

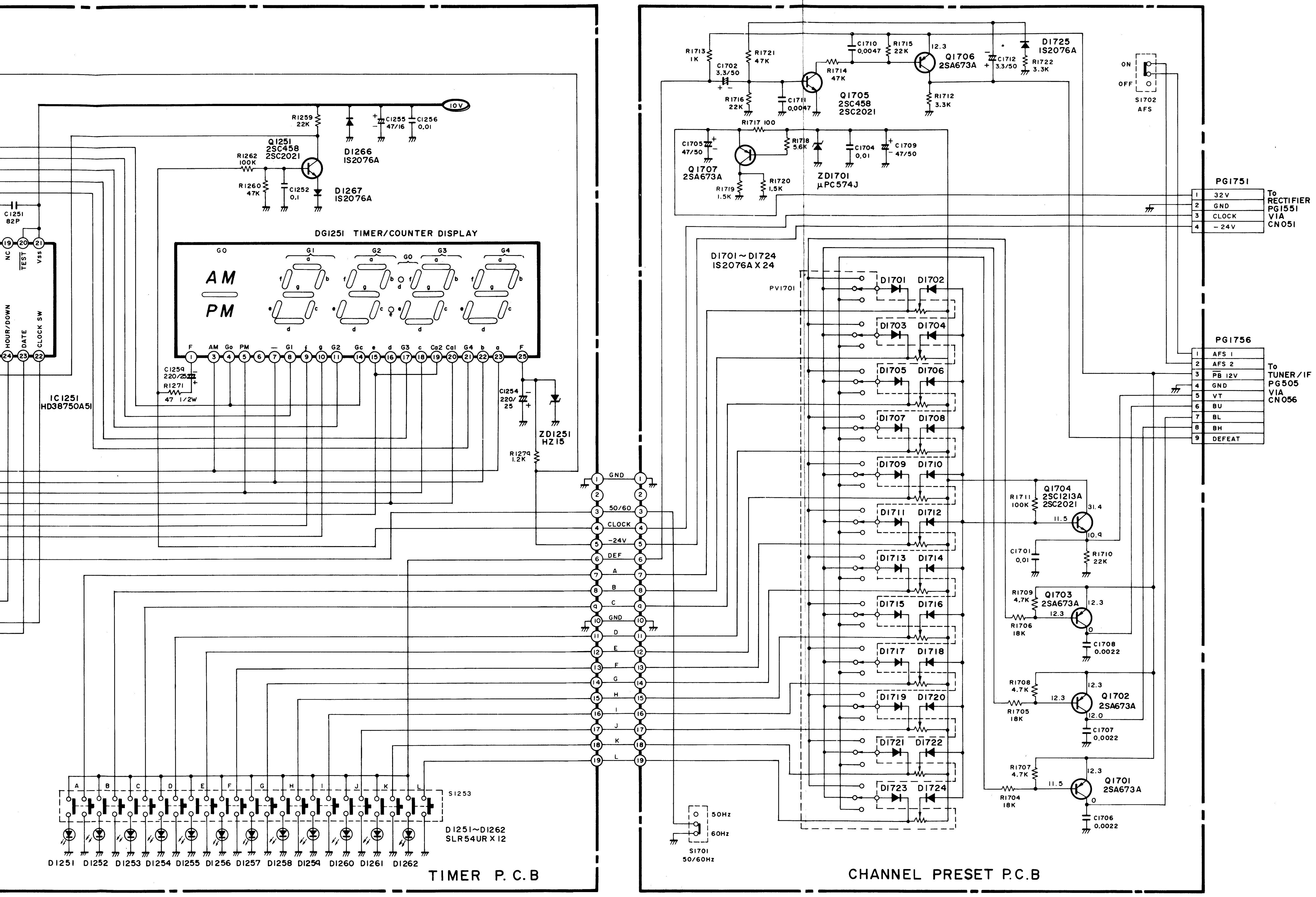


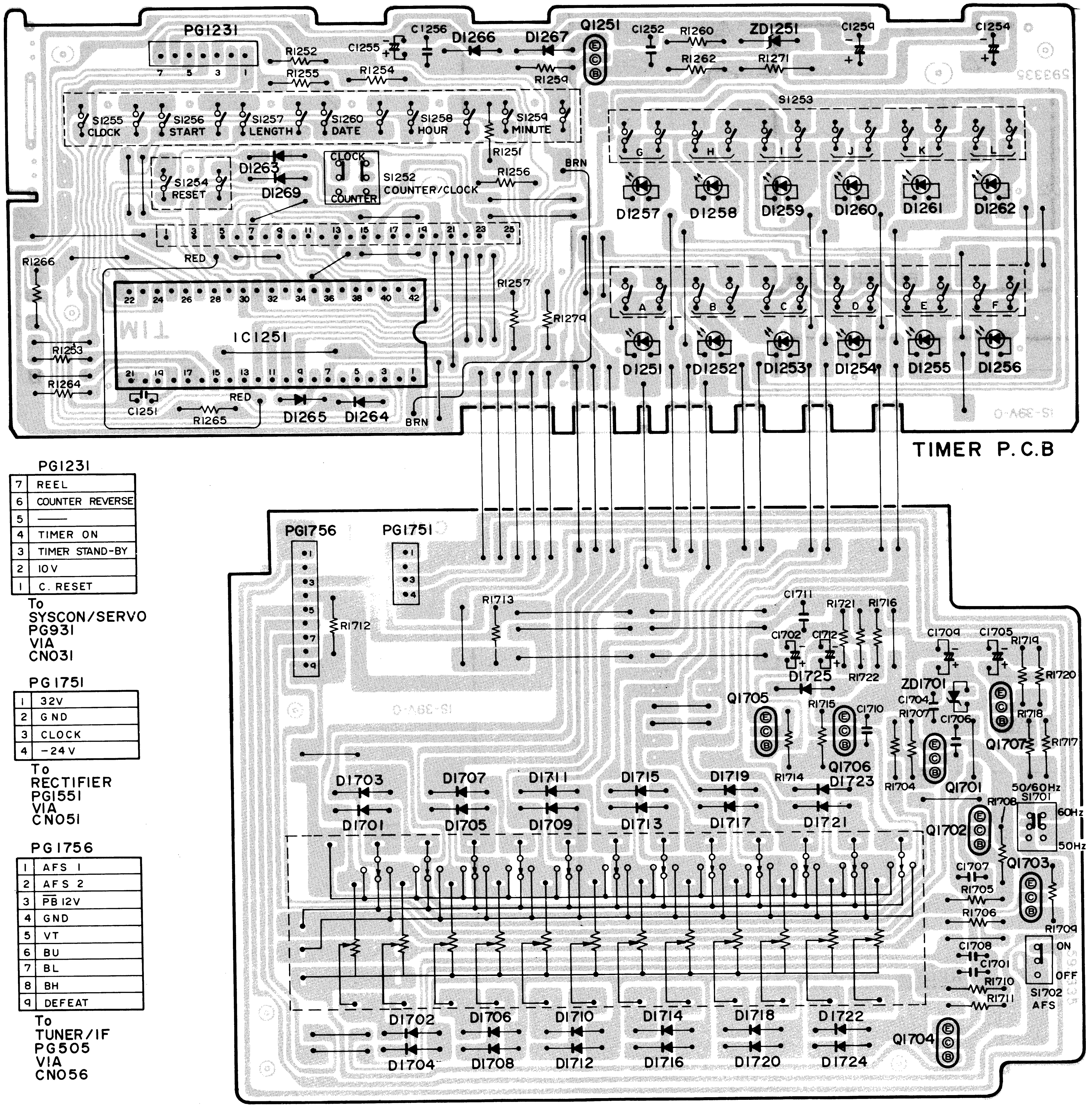
※ VOLTAGES ARE MEASURED IN PLAY MODE, AND
VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

TIMER/ CHANNEL PRESET



To SYSCON/SERVO PG931 VIA CN031
PG1231
REEL
COUNTER REVERSE
TIMER ON
TIMER STAND-BY
10V
RESET
R1266 4.7K
R1252 4.7K
R1253 4.7K
R1255 4.7K
R1254 4.7K
R1251 4.7K
R1257 4.7K
R1256 12K
R1264 33K
C1251 82P
IC1251 HD38750A51
COUNTER REVERSE
TIMER ON
NC
DIGIT 3
DIGIT 1
DIGIT 2
GRID 4
GRID 3
GRID 2
GRID 1
GRID 0
VDISP
C. RESET
VBB
VDD
OSC
TEST
VSS
POWER CONTROL
TIMER STAND-BY
50/60Hz
SEGMENT g
SEGMENT f
SEGMENT e
SEGMENT d
SEGMENT c
SEGMENT b
SEGMENT a
REEL
CLOCK
START
LENGTH
MATRIX 1
MATRIX 0
MINUTE/UP
HOUR/DOWN
DATE
CLOCK SW
Q1251 2SC458 2SC2021
R1259 22K
R1262 100K
R1260 47K
C1252 0.1
C1255 47/16
C1256 0.01
D1266 1S2076A
D1267 1S2076A
DG1251 TIMER/COUNTER DISPLAY
AM
PM
G0
G1
G2
G3
G4
C1259 220/25
R1271 47 1/2W
C1254 220/25
ZD1251 HZ15
R1279 1.2K
S1255 CLOCK
S1256 START
S1257 LENGTH
S1258 HOUR
S1259 MINUTE
S1260 DATE
CLOCK
COUNTER
S1252 COUNTER/CLOCK
S1254 COUNTER RESET
D1265 1S2076A
D1264 1S2076A
D1269 1S2076A
D1263 1S2076A
S1253
D1251~D1262 SLR54UR X 12
D1251 D1252 D1253 D1254 D1255 D1256 D1257 D1258 D1259 D1260 D1261 D1262
GND
50/60
CLOCK
-24V
DEF
A
B
C
GND
D
E
F
G
H
I
J
K
L
TIMER P.C.B
R1713 1K
C1702 3.3/50
R1721 47K
R1716 22K
C1711 0.0047
R1714 47K
C1710 0.0047
R1715 22K
Q1705 2SC458 2SC2021
R1717 100
C1705 47/50
R1718 5.6K
C1704 0.01
C1709 47/50
Q1707 2SA673A
R1719 1.5K
R1720 1.5K
ZD1701 µPC574J
D1701~D1724 1S2076A X 24
PV1701
D1701
D1703
D1705
D1707
D1709
D1711
D1713
D1715
D1717
D1719
D1721
D1723
50Hz
60Hz
S1701 50/60Hz
CHANNEL P


DG1251 TIMER/COUNTER DISPLAY
AM
PM
GO
G1
G2
G3
G4
10V
R1259 22K
D1266 1S2076A
C1255 47/16
C1256 0.01
Q1251 2SC458 2SC2021
R1262 100K
R1260 47K
C1252 0.1
D1267 1S2076A
C1251 82P
NC
TEST
Vss
HOUR/DOWN
DATE
CLOCK SW
IC1251 HD38750A51
C1259 220/25
R1271 47 1/2W
C1254 220/25
ZD1251 HZ15
R1279 1.2K
F
AM
Go
PM
G1
f
g
G2
Gc
e
d
G3
c
Ca2
Ca1
G4
b
a
GND
50/60
CLOCK
-24V
DEF
A
B
C
D
E
F
G
H
I
J
K
L
S1253
D1251~D1262 SLR54UR X 12
D1251
D1252
D1253
D1254
D1255
D1256
D1257
D1258
D1259
D1260
D1261
D1262
TIMER P.C.B
R1713 1K
C1702 3.3/50
R1721 47K
R1716 22K
C1711 0.0047
C1710 0.0047
R1715 22K
R1714 47K
Q1705 2SC458 2SC2021
12.3
Q1706 2SA673A
R1712 3.3K
C1712 3.3/50
D1725 1S2076A
R1722 3.3K
R1717 100
C1705 47/50
Q1707 2SA673A
R1718 5.6K
ZD1701 μPC574J
C1704 0.01
C1709 47/50
R1719 1.5K
R1720 1.5K
ON
OFF
S1702 AFS
PG1751
32V
GND
CLOCK
-24V
To RECTIFIER PG1551 VIA CN051
D1701~D1724 1S2076A X 24
PV1701
D1701
D1702
D1703
D1704
D1705
D1706
D1707
D1708
D1709
D1710
D1711
D1712
D1713
D1714
D1715
D1716
D1717
D1718
D1719
D1720
D1721
D1722
D1723
D1724
PG1756
AFS 1
AFS 2
PB 12V
GND
VT
BU
BL
BH
DEFEAT
To TUNER/IF PG505 VIA CN056
Q1704 2SC1213A 2SC2021
R1711 100K
31.4
11.5
10.9
C1701 0.01
R1710 22K
R1709 4.7K
Q1703 2SA673A
R1706 18K
C1708 0.0022
R1708 4.7K
R1705 18K
Q1702 2SA673A
12.0
C1707 0.0022
R1707 4.7K
R1704 18K
Q1701 2SA673A
C1706 0.0022
50Hz
60Hz
S1701 50/60Hz
CHANNEL PRESET P.C.B


PG1231
7 5 3 1
R1252
R1255
C1255
R1254
C1256
D1266
D1267
R1259
Q1251
C1252
R1260
R1262
ZD1251
R1271
C1259
C1254
S1255 CLOCK
S1256 START
S1257 LENGTH
S1260 DATE
S1258 HOUR
S1259 MINUTE
R1251
S1254 RESET
D1263
D1269
CLOCK
COUNTER
S1252 COUNTER/CLOCK
R1256
BRN
S1253
G H I J K L
D1257
D1258
D1259
D1260
D1261
D1262
1 3 5 7 9 11 13 15 17 19 21 23 25
RED
R1266
22 24 26 28 30 32 34 36 38 40 42
IC1251
21 19 17 15 13 11 9 7 5 3 1
R1257
R1279
A B C D E F
D1251
D1252
D1253
D1254
D1255
D1256
R1253
R1264
C1251
R1265
RED
D1265
D1264
BRN
PG1756
PG1751
R1712
R1713
C1711
R1721
R1716
C1702
C1712
R1722
D1725
C1709
C1705
R1719
R1720
ZD1701
C1704
R1707
C1706
R1718
Q1705
R1715
C1710
Q1706
R1714
D1723
Q1707
R1717
R1704
Q1701
50/60Hz
S1701
60Hz
50Hz
R1708
Q1702
Q1703
C1707
R1705
R1706
R1709
ON
OFF
C1708
C1701
R1710
R1711
S1702 AFS
D1703
D1707
D1711
D1715
D1719
D1701
D1705
D1709
D1713
D1717
D1721
D1702
D1706
D1710
D1714
D1718
D1722
D1704
D1708
D1712
D1716
D1720
D1724
Q1704

TIMER P.C.B

CHANNEL PRESET P.C.B

PG1231

7	REEL
6	COUNTER REVERSE
5	——
4	TIMER ON
3	TIMER STAND-BY
2	10V
1	C. RESET

To
SYSCON/SERVO
PG931
VIA
CN031

PG1751

1	32V
2	GND
3	CLOCK
4	−24V

To
RECTIFIER
PG1551
VIA
CN051

PG1756

1	AFS 1
2	AFS 2
3	PB 12V
4	GND
5	VT
6	BU
7	BL
8	BH
9	DEFEAT

To
TUNER/IF
PG505
VIA
CN056

Q1701

B	11.5
C	0
E	12.3

Q1702

B	12.3
C	12.0
E	12.3

Q1703

B	12.3
C	0
E	12.3

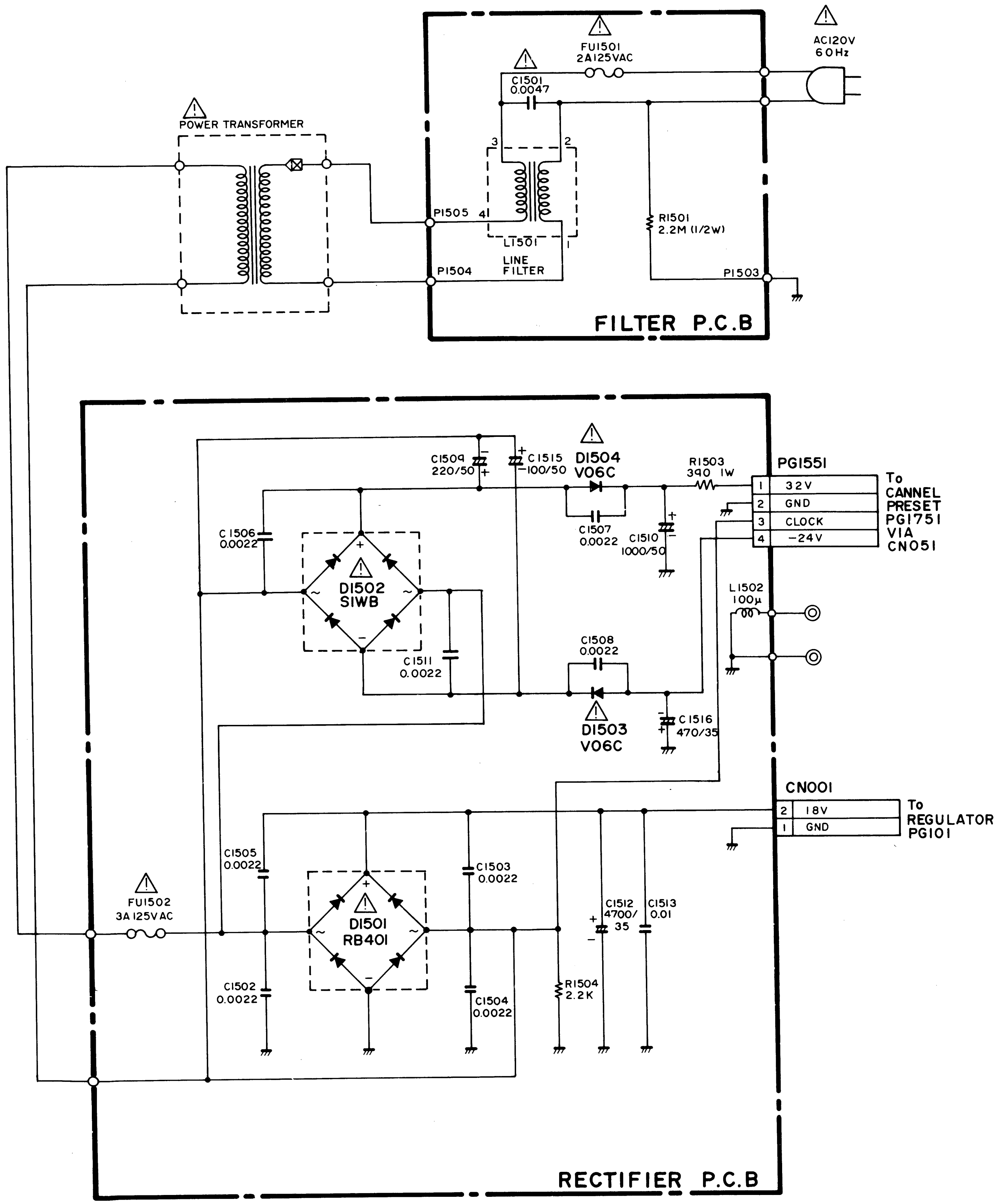
Q1704

B	11.5
C	31.4
E	10.9

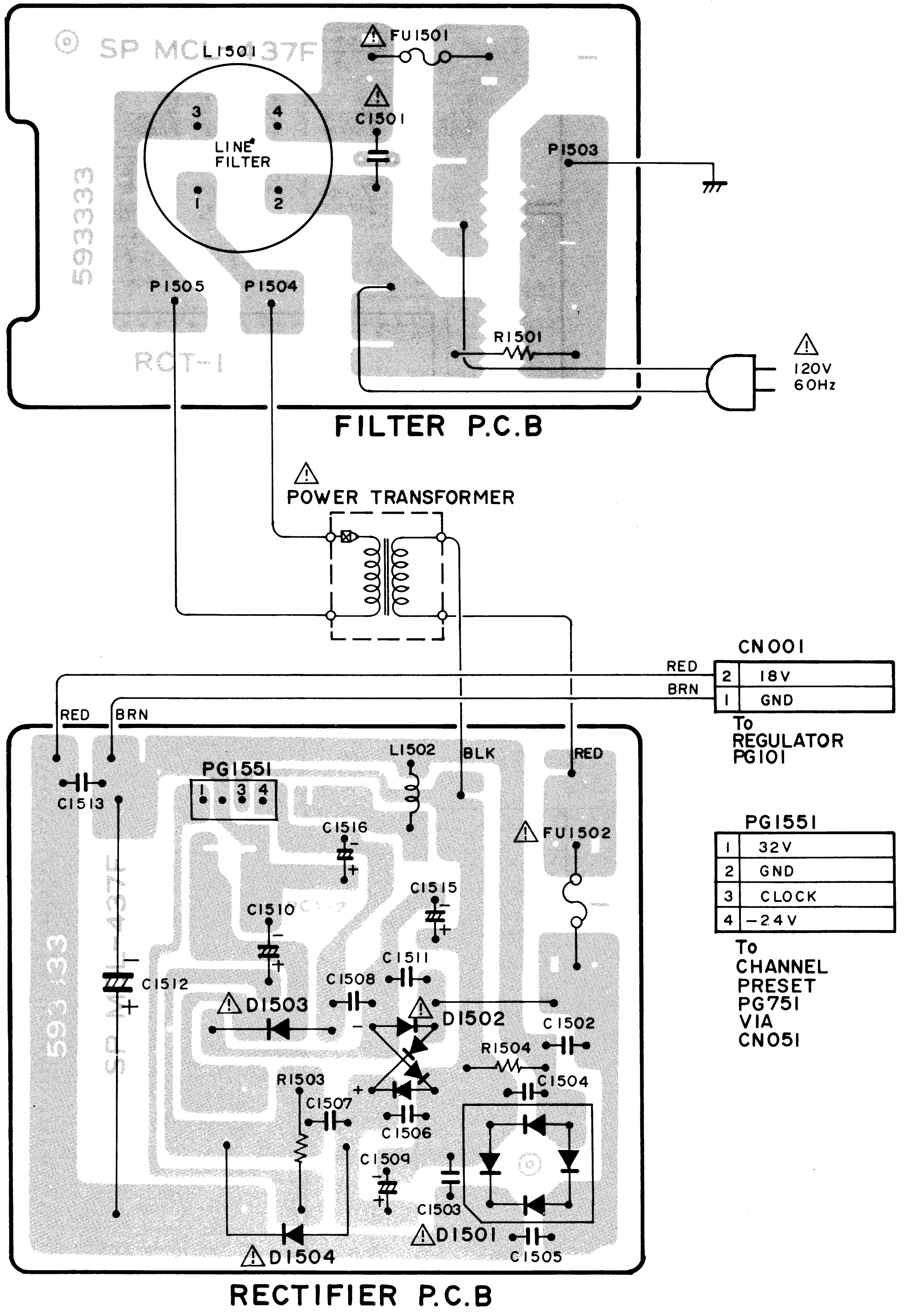
Q1706

B	12.3
C	0
E	12.3

RECTIFIER



POWER TRANSFORMER
FU1501
2A125VAC
C1501
0.0047
AC120V
60Hz
P1505
P1504
P1503
L1501
LINE FILTER
R1501
2.2M (1/2W)
FILTER P.C.B
C1509
220/50
C1515
100/50
D1504
V06C
R1503
390 1W
PG1551
1 32V
2 GND
3 CLOCK
4 -24V
To CANNEL PRESET PG1751 VIA CN051
C1506
0.0022
D1502
SIWB
C1507
0.0022
C1510
1000/50
L1502
100μ
C1511
0.0022
C1508
0.0022
D1503
V06C
C1516
470/35
CN001
2 18V
1 GND
To REGULATOR PG101
FU1502
3A 125VAC
C1505
0.0022
C1503
0.0022
D1501
RB401
C1512
4700/35
C1513
0.01
C1502
0.0022
C1504
0.0022
R1504
2.2K
RECTIFIER P.C.B



SP MCL1437F
L1501
FU1501
C1501
LINE FILTER
P1503
593333
P1505
P1504
R1501
RCT-1
120V
60Hz
FILTER P.C.B
POWER TRANSFORMER
RED
BRN
CN001
2 18V
1 GND
To REGULATOR PG101
BLK
RED
L1502
PG1551
C1513
C1516
FU1502
C1515
C1510
C1511
C1512
C1508
D1503
D1502
C1502
R1504
R1503
C1507
C1504
C1506
C1509
C1503
D1501
D1504
C1505
RECTIFIER P.C.B
PG1551
1 32V
2 GND
3 CLOCK
4 -24V
To CHANNEL PRESET PG751 VIA CN051

REPLACEMENT PARTS LIST

ELECTRICAL PARTS LIST

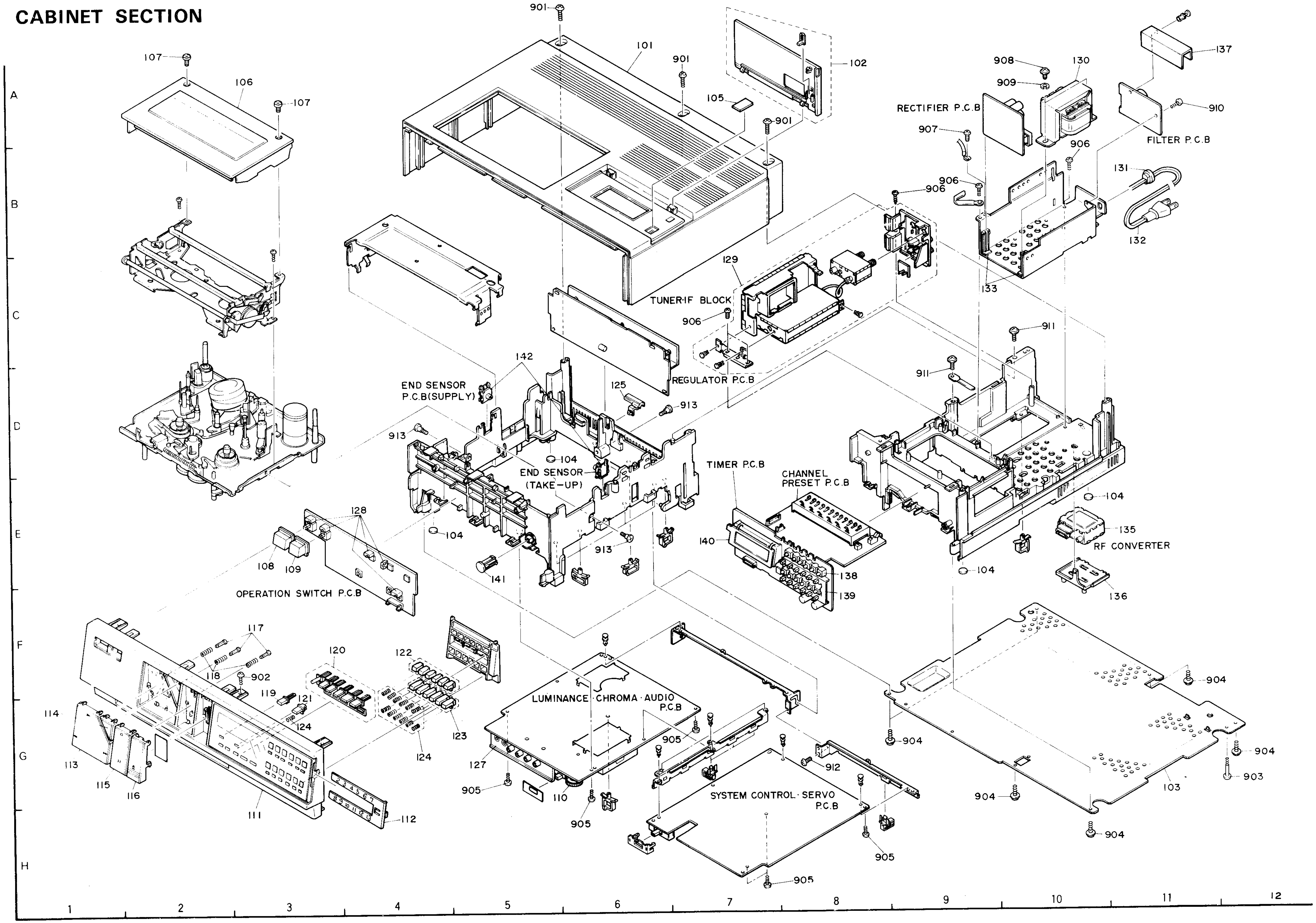
SYMBOL-NO	P-NO	DESCRIPTION
		CAPACITORS
C630	0256383	TANTALUM ELECTROLYTIC 4.7MF 16V
C642	0256383	TAMTALUM ELECTROLYTIC 4.7MF 16V
C903	0208141	CERAMIC DISC (RESISTOR SHAPE) 100PF +-5%
C906	0208141	CERAMIC DISC (RESISTOR SHAPE)
		RESISTORS
RA051	5068211	RESISTOR PACK R1310
RA601	5378951	RESISTOR CLOCK
RT101	5007432	SEMI VARIABLE 1.0KOHM
RT201	5007433	SEMI VARIABLE 2.2KOHM
RT202	5007434	SEMI VARIABLE 4.7KOHM
RT401	5007437	SEMI VARIABLE 47KOHM
RT404	5007438	SEMI VARIABLE 100KOHM
RT601	5007466	SEMI VARIABLE 220KOHM
RT603-604	5007464	SEMI VARIABLE 47KOHM
RT607-608	5007461	SEMI VARIABLE 4.7KOHM
RV001	5005315	VARIABLE RESISTOR
R1501	0134704	COMPOSITION RESISTOR 2.2M OHM +-10% 1/2G
R1503	0111078	OXIDE METAL FILM RESISTOR 390OHM+-5%,1W
R423	0170481	FUSE RESISTOR 22OHM+-5% 1/4W
R45[illegible]	0170472	FUSE RESISTOR 3.3OHM+-5% 1/4W
R438	0149705	METAL FILM RESISTOR 470 OHM
R949	0171264	OXIDE METAL FILM RESISTOR
R954	0171261	OXIDE METAL FILM RESISTOR
		SEMI-CONDUCTORS
D001-002	5331592	DIODE 1SS133
D051-052	5330573	DIODE 1S2473
D102	5331671	DIODE DS135D-FA3
D103	5330573	DIODE 1S2473
D104	5331671	DIODE DS135D-FA3
D105-108	5331592	DIODE 1SS133
D1251-1262	5380721	LED SLR-54UR4
D1263	5331592	DIODE 1SS133
D1264	5330573	DIODE 1S2473
D1266-1267	5331592	DIODE 1SS133
D1269	5331592	DIODE 1SS133
⚠ D1501	5331931	DIODE RB401
⚠ D1502	5331921	DIODE S1WD
⚠ D1503-1504	5330101	RECTIFIER SILICON V06C 15K
D1701-1704	5331592	DIODE 1SS133
D1705-1712	5331592	DIODE 1SS133
D1713-1720	5331592	DIODE 1SS133
D1721-1724	5331592	DIODE 1SS133
D1725	5331592	DIODE 1SS133
D201	5331592	DIODE 1SS133
D203	5331592	DIODE 1SS133
D204-206	5331051	DIODE 1K60P
D207-208	5331592	DIODE 1SS133
D210-211	5331592	DIODE 1SS133
D401-402	5331592	DIODE 1SS133
D403	5331511	DIODE DAN201
D406	5330131	DIODE 1S2076
D407	5331592	DIODE 1SS133
D481	5340205	VARISTOR VD1221
D482	5331592	DIODE 1SS133
D605-609	5331592	DIODE 1SS133
D612-619	5331592	DIODE 1SS133
D621-629	5331592	DIODE 1SS133
D631-632	5331592	DIODE 1SS133
D633-634	5330131	DIODE 1S2076
D901	5331592	DIODE 1SS133
D902-903	5331671	DIODE DS135D-FA3
D904	5331592	DIODE 1SS133
D905-906	5331511	DIODE DAN201
D907-909	5331592	DIODE 1SS133
D911-912	5331511	DIODE DAN201
D913	5331592	DIODE 1SS133
D914	5331592	DIODE 1SS133
D915-916	5331592	DIODE 1SS133
D918-919	5331592	DIODE 1SS133
D920	5331592	DIODE 1SS133
D921	5331592	DIODE 1SS133
D922	5330131	DIODE 1S2076
IC102	5355241	IC NJD6506S
IC103	5369181	IC M5218L
IC104	5369171	IC M54543L
IC1251	5365844	IC HD38750A51
IC141	5391032	HOLEIC DN6838A
IC201	5375961	IC HT4234
IC202	5375972	IC HT4235
IC203	5375631	IC HT4236
IC204	5369391	IC MSL9378RS
IC401	5352631	IC BA5102
IC481	5355451	IC HA13402
IC601	5350251	IC HA1406
IC602	5355491	IC HA11747
IC603-604	5355501	IC HA11749
IC901	5369171	IC M54543L
IC902	5365846	IC HD38750A65
IC903	5369251	IC BA6304
IC904	5365582	IC HD38702A23
LED051	5380711	LED TLG123A
LED052-055	5380691	LED SLR34UR
Q051	5321663	TRANSISTOR 2SC2021R/S
Q101-103	5323221	TRANSISTOR 2SD972
Q104	5322733	TRANSISTOR 2SA952ML
Q105	5321663	TRANSISTOR 2SC2021R/S
Q106	5323331	TRANSISTOR 2SB772-Q
Q107	5323332	TRANSISTOR 2SD882-Q
Q108	5323221	TRANSISTOR 2SD972
Q1251	5321663	TRANSISTOR 2SC2021R/S
Q141-142	5380131	PHOTO TRANSISTOR
Q1701-1703	5320603	TRANSISTOR SILICON 2SA673A-C 80MHZ 400MW
Q1704-1705	5321663	TRANSISTOR 2SC2021R/S
Q1706-1707	5320603	TRANSISTOR SILICON 2SA673A-C 80MHZ 400MW
Q201-208	5321663	TRANSISTOR 2SC2021R/S
Q209	5320619	TRANSISTOR 2SC1213CD
Q211	5321663	TRANSISTOR 2SC2021R/S
Q212-213	5321255	TRANSISTOR 2SA844CD
Q214	5321663	TRANSISTOR 2SC2021R/S
Q215	5321255	TRANSISTOR 2SA844CD
Q216	5321663	TRANSISTOR 2SC2021R/S
Q218-219	5321663	TRANSISTOR 2SC2021R/S
Q221-222	5321663	TRANSISTOR 2SC2021R/S
Q223	5320619	TRANSISTOR 2SC1213CD
Q227	5321663	TRANSISTOR 2SC2021R/S
Q401-403	5321663	TRANSISTOR 2SC2021R/S
Q405-409	5321663	TRANSISTOR 2SC2021R/S
Q410	5321213	TRANSISTOR 2SD468C 190MHZ 0.9MW
Q481-482	5321662	TRANSISTOR 2SC2021S
Q601	5322892	TRANSISTOR 2SA1198RS
Q602	5320069	TRANSISTOR 2SC458CD
Q607	5320069	TRANSISTOR 2SC458CD
Q908	5321252	TRANSISTOR
Q901	5322732	TRANSISTOR 2SA952-ML2
Q902	5321666	TRANSISTOR 2SC2021-SE
Q903	5322732	TRANSISTOR 2SA952-ML2
Q904	5321666	TRANSISTOR 2SC2021-SE
Q905	5322732	TRANSISTOR 2SA952-ML2
Q906	5321666	TRANSISTOR 2SC2021-SE
Q907	5322732	TRANSISTOR 2SA952-ML2
Q909	5321666	TRANSISTOR 2SC2021-SE
ZD101	5330563	DIODE HZ16-3
ZD102	5330535	ZENNER DIODE HZ12B-3
ZD103	5330393	ZENER DIODE SILICON HZ6C 1MHZ
ZD104	5330535	ZENNER DIODE HZ12B-3
ZD105	5330329	ZENNER DIODE HZ9C2
ZD106	5330391	DIODE-ZENER SILICON
ZD1251	5330541	ZENER DIODE HZ-15
ZD1701	5350611	IC UPC574J
ZD481	5330713	DIODE HZ-3B
ZD601	5330396	ZENNER DIODE HZ-6A1
ZD901	5330556	ZENNER DIODE HZ11A2
ZD901	5330556	ZENNER DIODE HZ11A2
ZD902	5330535	DIODE HZ-9A2
		TRANSFORMERS
T401	5260366	BIAS COIL
		COILS
⚠ L1501	5270241	LINE FILTER
L1502	5152087	PEAKING COIL 100MICROH
L201	5152087	PEAKING COIL 100MICROH
L203	5152092	PEAKING COIL 220MICROH
L204	5152099	CHOKE COIL 820MICO H+-10%
L205	5152081	CHOKE 3.3MICROH
L206-207	5152087	PEAKING COIL 100MICROH
L208	5152082	CHOKE COIL 39MICROH
L209	5152086	CHOKE COIL 82MICROH
L210	5152087	PEAKING COIL 100MICROH
L211	5152083	CHOKE COIL
L212-214	5152087	PEAKING COIL 100MICROH
L215	5152087	PEAKING COIL 100MICROH
L216	5152083	CHOKE COIL
L401	5150366	CHOKE COIL 15 MH
L402	5150362	CHOKE COIL
L404	5152099	CHOKE COIL
		MISCELLANEOUS
	4613551	CHANNEL SHEET
⚠	5722211	FUSE HOLDER
	6866132	HOLE IC HOLDER
	5310811	TIMER DISPLAY
CP201	5123837	TRAP COIL
CP202	5162035	FILTER
CP203	5161953	HIGH PASS FILTER
CP204	5162112	DELAY LINE
CP205	5162031	LOW PASS FILTER
CP206	5123831	TRAP FILTER
CP207	5162041	BAND PASS FILTER
CP208	5162033	LOW PASS FILTER
CP209	5162042	BAND PASS FILTER
DL201	5785211	DELAY LINE

SYMBOL-NO	P-NO	DESCRIPTION
DL202	5785052	DELAY LINE
⚠FU1501	5721404	FUSE 125V 1A
⚠FU1502	5721408	FUSE
PH101	0249795	POTHISTOR
PV1701	5008742	PRI SET VARIABLE RESISTOR
RL401	5641413	RELAY
S001	5623551	SLIDE SWITCH
S051-052	5633792	PUSH SWITCH
S053-058	5633851	PUSH SWITCH
S1252	5633792	PUSH SWITCH
S1253	5634502	SWITCH
S1254-1262	5633851	PUSH SWITCH
S1701	5623841	SLIDE SWITCH
S1702	5633694	SWITCH (AFS)
S601	5624241	SLIDE SWITCH

MECHANICAL PARTS

SYMBOL-NO	P-NO	DESCRIPTION
		FOR FINAL ASSEMBLY
101	6109212	TOP CASE ASSEMBLY
102	6099862	PRE SET DOOR
103	6054742	BOTTOM COVER
105	6571124	CAP
106	6094092	CASSETTE LID
107	7547744	SPECIAL SCREW
108	6057013	POWER BUTTON
109	6057014	TIMER BUTTON
110	6292951	KNOB (TRACKING)
111	6225724	FRONT PANEL ASSEMBLY
112	6867052	CHANNEL CARD F
113	6057002	PLAY/F.F/REW BUTTON
114	6056982	RECORDING BUTTON
115	6056992	STOP/STILL/PAUSE BUTTON
116	6056922	EJECT BUTTON
117	6866882	SHAFT
118	6305566	SPRING
119	6056932	TIMER SET BUTTON A
120	6056942	TIMER SET BUTTON B
121	6056892	COUNTER BUTTON
122	6056883	CHANNEL BUTTON
123	6056884	CHANNEL BUTTON
124	6303714	SPRING
125	6863962	REGULATER HOLDER
127	5672521	JACK PLATE
128	6866901	LED HOLDER A
129	5585861	TUNER IF BLOCK
⚠130	5212956	POWER TRANSFORMER
131	6794091	BUSHING
⚠132	5746492	POWER CORD
135	5585608	RF CONVERTER
136	6867041	RF.HOLDER
137	7759701	COVER
138	6866911	LED HOLDER B
139	6867951	LED HOLDER
140	6866931	TIMER HOLDER
141	6866891	EJECT SHAFT
142	6867061	END SENSOR HOLDER
202	6414651	SUPPLY REEL ASSEMBLY
203	6414672	TAKE UP REEL ASSEMBLY
204	6865761	RETAINER
205	7787032	THRUST SUPPORTER
206	7787412	WASHER
207	7778859	POLYSLIDER WASHER
208	6865662	BRAKE ARM
209	7375763	TENSION ARM ASSEMBLY
210	6865801	BRAKE L
211	6865811	BRAKE R
212	6302471	SPRING
213	6302083	SPRING
214	7376271	TENSION BAND
215	6865591	HOLDER
216	7375714	ARM BRACKET
217	6865575	F.F/REW ARM ASSEMBLY
218	7376303	LOADING LINK R ASSEMBLY
219	7376313	LOADING LINK L ASSEMBLY
220	6977583	GUIDE ROLLER BASE (SUPPLY)
221	6977582	GUIDE ROLLER BASE (TAKE-UP)
222	6977481	INCLINED GUIDE (SUPPLY)
223	6977491	INCLINED GUIDE (TAKE-UP)
224	6344252	GUIDE ROLLER SHAFT
225	6868061	GUIDE ROLLER T
226	7376171	GUID BASE HOLDER
227	6977561	CATCHER (SUPPLY)
228	6977571	CATCHER (TAKE-UP)
229	7553841	TAPE GUIDE
230	6304903	SPRING
231	6866112	IMPEDANCE ARM
232	5448791	FULL ERASE HEAD
233	6302391	SPRING
234	5448781	ACE HEAD
235	6304901	SPRING
236	7786245	WASHER
237	6865722	SUB BRAKE
238	6300084	SPRING
239	5577351	CAPSTAN MOTOR
240	6865673	RECORDING PREVENTION ARM
241	5633971	SWITCH (S141)
242	7788143	POLYSLIDER WASHER
243	6977821	PRESSURE ROLLER ARM
244	6383763	PRESSURE ROLLER ASSEMBLY
245	5633971	SWITCH (S142)
246	6547811	SPRING
247	7549271	X-ADJUST SCREW
301	7375443	CLUTCH PLATE ASSEMBLY
302	6355561	BELT
303	7375843	BRAKE SLIDER
304	6865731	SLIDER
305	6547821	SPRING
306	6866292	LORDING GEAR ASSEMBLY
307	6865791	TENSION ARM
308	6865692	EJECT ARM
309	6865701	EJECT SLIDER
310	6300375	SPRING FOR RECORDING PLATE
311	7376351	LOADING MOTOR
312	6355601	BELT

CABINET SECTION



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RECTIFIER P.C.B
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FILTER P.C.B
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TUNER·IF BLOCK
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REGULATOR P.C.B
142
END SENSOR
P.C.B(SUPPLY)
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104
END SENSOR
(TAKE-UP)
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TIMER P.C.B
CHANNEL
PRESET P.C.B
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RF CONVERTER
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OPERATION SWITCH P.C.B
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LUMINANCE · CHROMA · AUDIO
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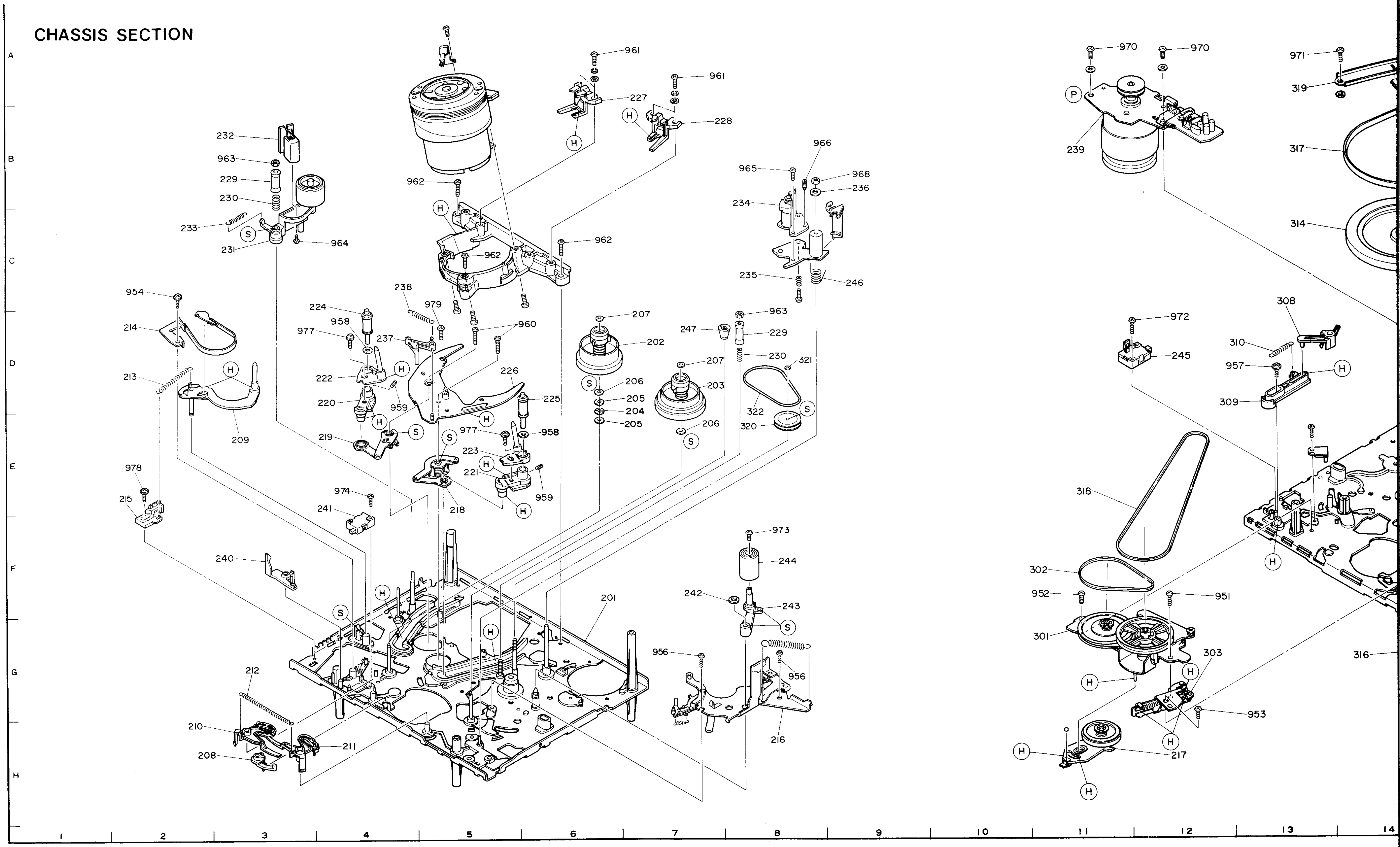
CHASSIS SECTION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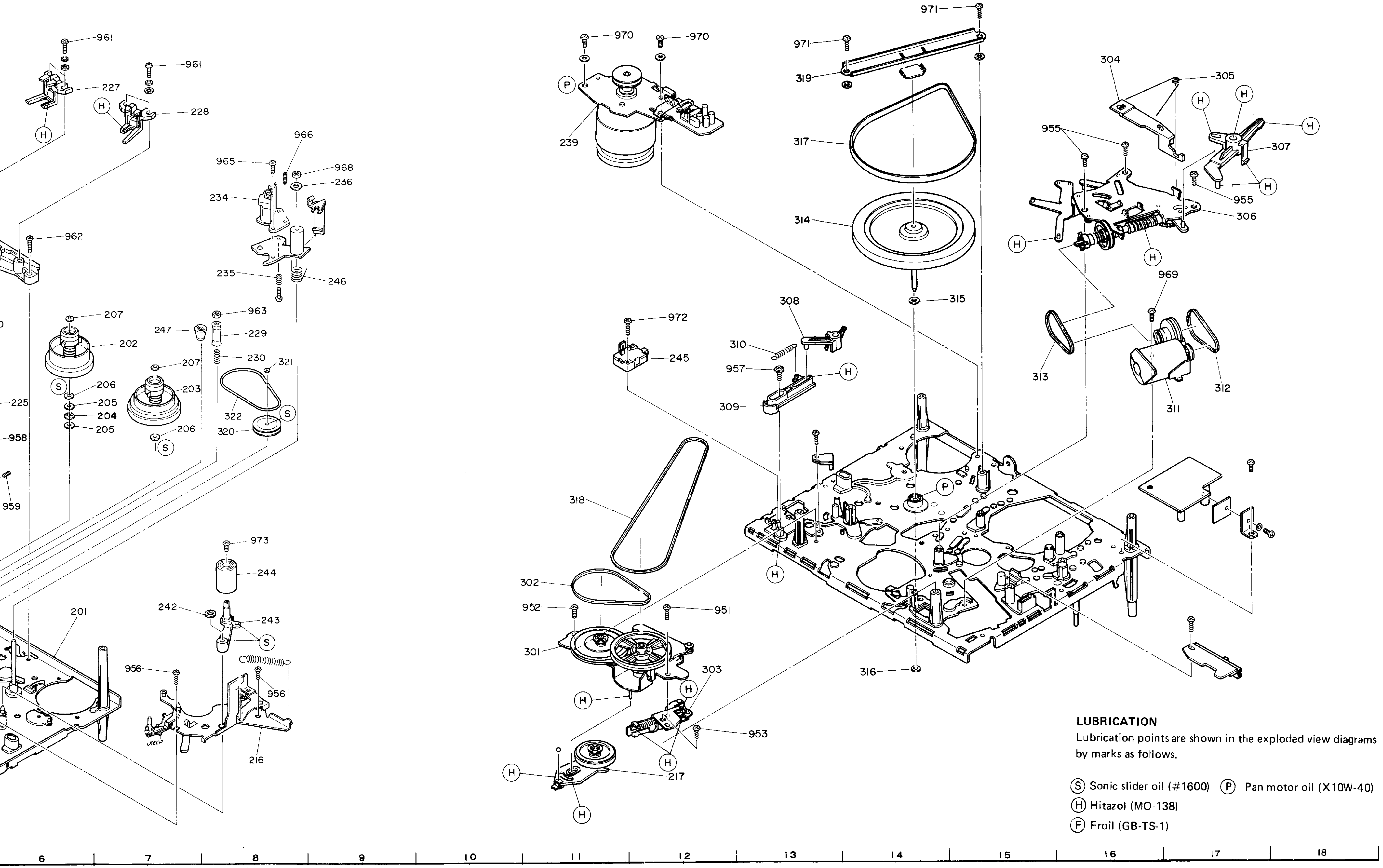
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LUBRICATION

Lubrication points are shown in the exploded view diagrams by marks as follows.

Ⓢ Sonic slider oil (#1600) Ⓟ Pan motor oil (X10W-40)

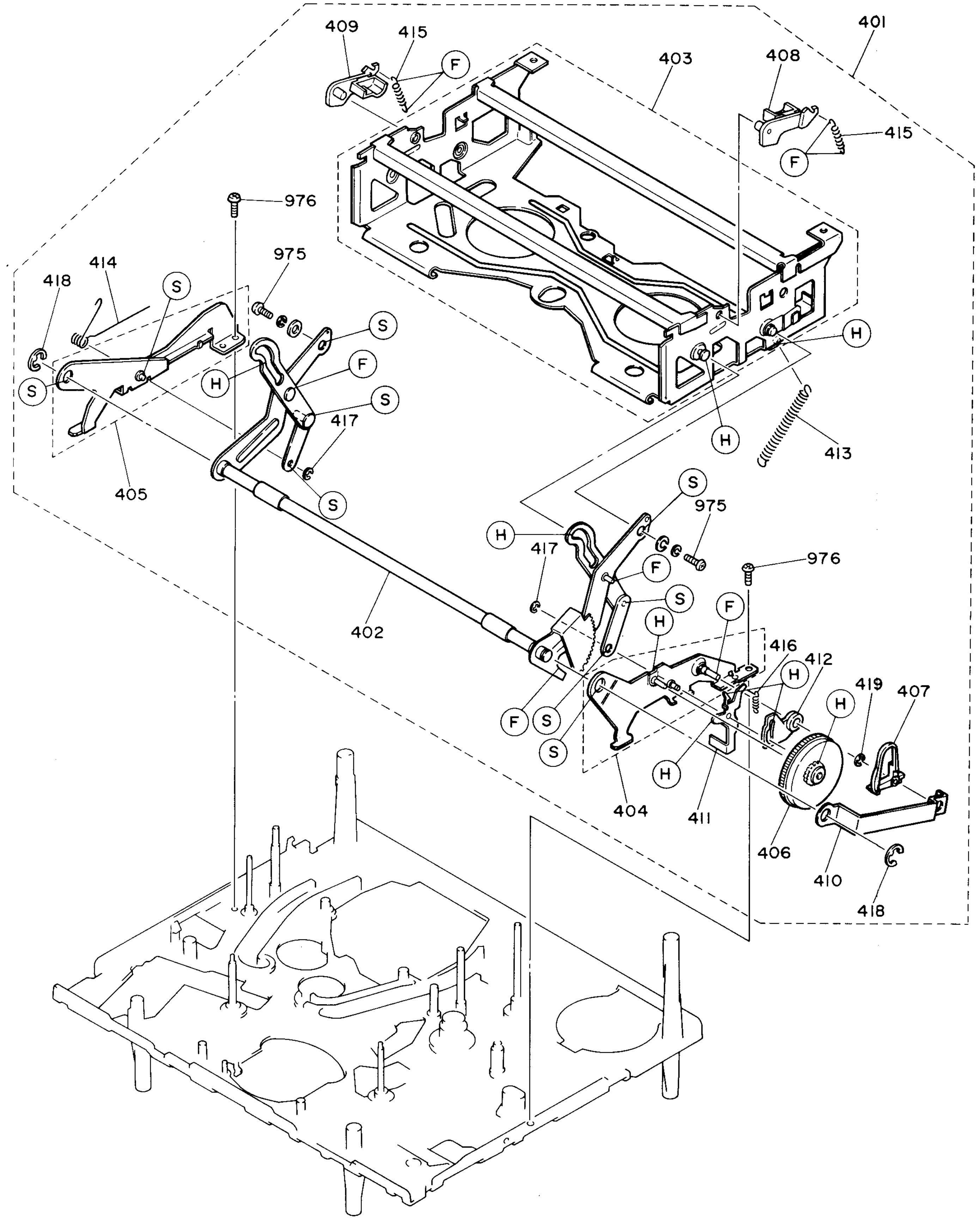
Ⓗ Hitazol (MO-138)

Ⓕ Froil (GB-TS-1)

SYMBOL-NO	P-NO	DESCRIPTION
313	6355591	BELT
314	6977431	FLYWHEEL
315	7788142	POLYSLIDER WASHER (THRUST)
316	7788141	POLYSLIDER WASHER
317	6357531	BELT
318	6355581	BELT
319	7376323	FLYWHEEL HOLDER
320	6869291	PULLEY
321	7778859	POLYSLIDER WASHER
322	6355561	BELT
402	7376072	HOLDER LINK ASSEMBLY
403	7376032	CASSETTE HOLDER ASSEMBLY
404	7375902	BRACKET R
405	7375912	BRACKET L
406	6866061	DUMPER ASSEMBLY
407	6866081	CLUTCH ARM
408	6866152	PRESSURE ARM(RIGHT)
409	6866142	PRESSURE ARM(LEFT)
411	7375921	LOCK ARM
412	6866072	LOCK ARM
413	6542591	SPRING
414	6547881	SPRING L
415	6542581	SPRING
416	6542571	LOCK SPRING
501	5458411	UPPER CYLINDER

SYMBOL-NO	P-NO	DESCRIPTION
502	5458421	LOWER CYLINDER ASSEMBLY
503	5792131	BRUSH
504	5792091	STATOR
505	5772491	ROTOR ASSEMBLY
506	5792121	WIRE HOLDER
507	5994731	CYL.FG PC BOARD
901	7781131	B TIGHTING SCREW-3MMDX12MM
902	7781131	B TIGHTING SCREW-3MMDX12MM
903	7781972	SCREW (B.T3X45)(BLACK)
904	7781131	B TIGHTING SCREW-3MMDX12MM
911	7781131	B TIGHTING SCREW-3MMDX12MM
913	7777615	SPECIAL SCREW
958	7788172	WASHER
959	7773083	SCREW
966	7773086	SCREW
967	8741414	BINDING SCREW - 3MMD X 14MM
		FOR ACCESSARIES
	5679542	CONNECTOR
	5679591	MATCHING CONNECTER
	5893171	FEEDER CABLE
	5896761	CABLE
	6867072	CHANNEL CARD
	7089492	PAUSE SWITCH

CASSETTE HOLDER SECTION



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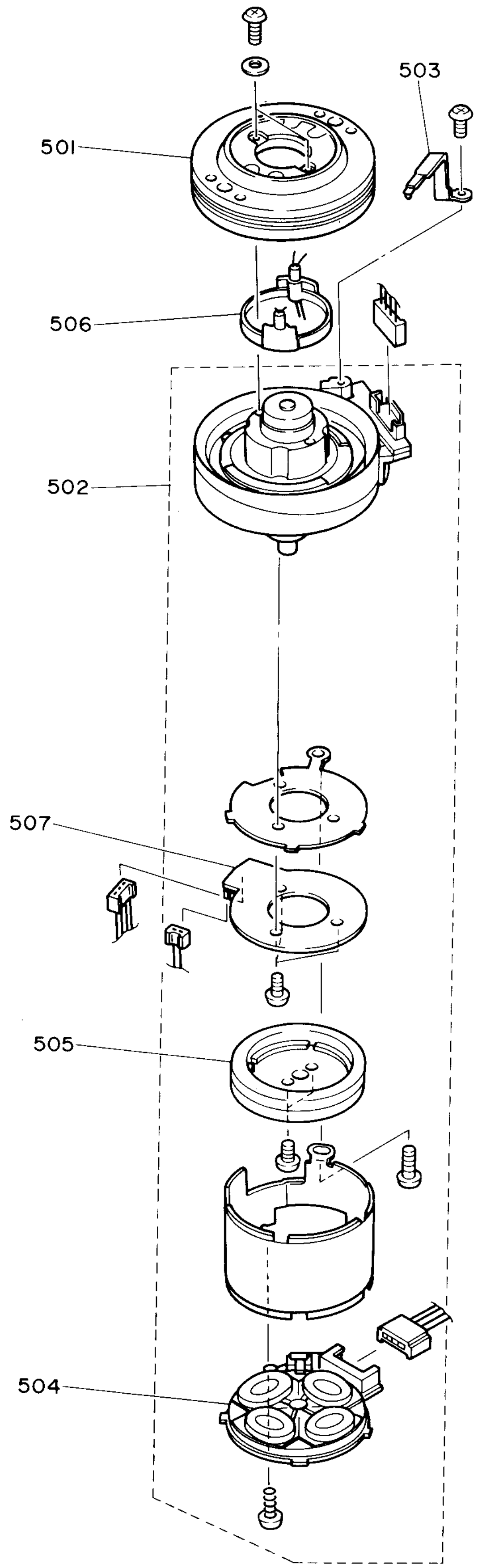
CYLINDER SECTION



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